CONVENTION NUMBER

TEXTILE WORLD RECORD

OCTOBER 1918

OCT 17 1918

THE BOARD WALK AND BEACH AT ATLANTIC CITY, SHOWING CONVENTION HEADQUARTERS OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS

LORD & NAGLE COMPANY *Boston Mass.*

The TEXTILE-FINISHING MACHINERY CO.

Howard Building, Providence, R. I.

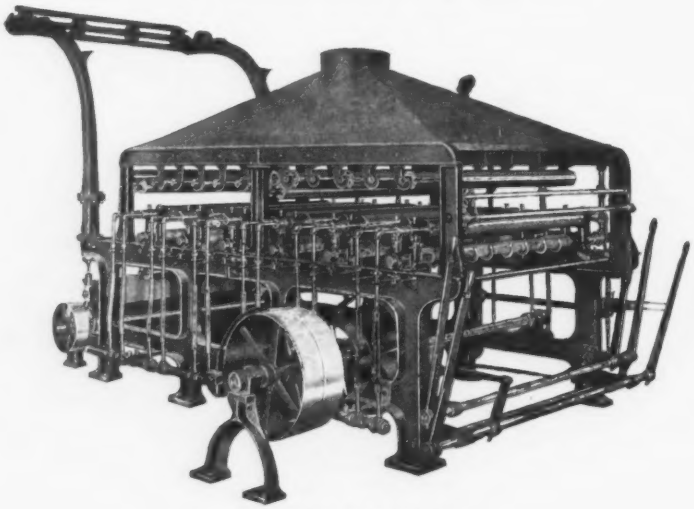
BUILDERS OF

Singeing, Bleaching, Mercerizing, Dyeing, Drying, Printing and Finishing Machinery

FOR

TEXTILE FABRICS AND WARPS

Plans and Estimates for Complete Plants



6 BURNER GAS SINGER

2, 3, 4, 5 and 6 Burner Gas Singers

FOR

Silk, Cotton, Woolen and Worsted Goods

Bleaching Kiers with Patent Circulators

FOR

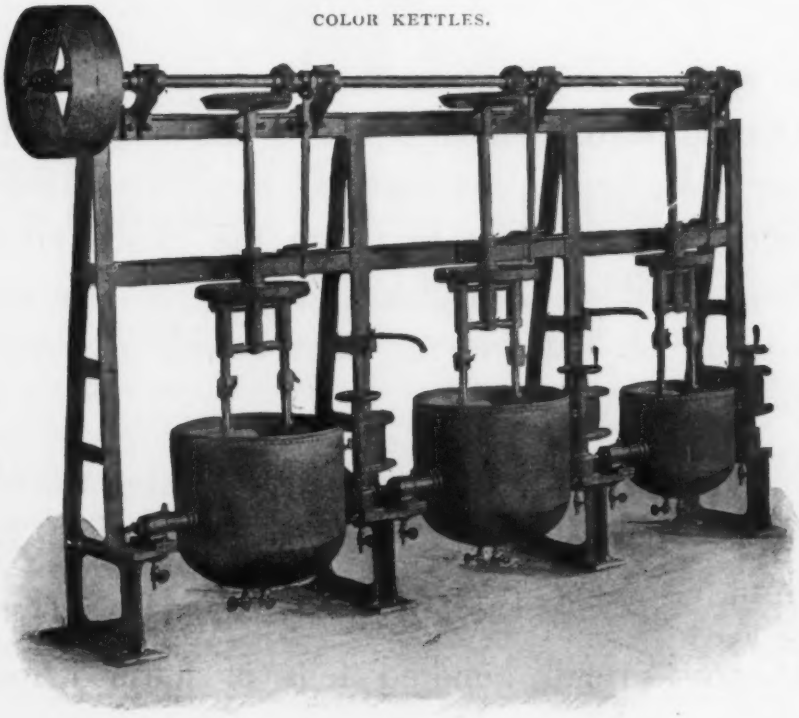
Raw Stock, Yarn, Woven and Knit Goods

H. W. BUTTERWORTH & SONS CO.

PHILADELPHIA, PA.

Providence Office, Room 417 Industrial Trust Building.

COLOR KETTLES.



Bleaching, Dyeing, Drying, Finishing, Machinery

for all kinds of textile fabrics.

Northrop Loom Repairs

TRADE MARK REGISTERED

We again call attention to the importance of purchasing Northrop loom repairs of the makers of the looms. We have spent thousands of dollars in fitting up moulding machines to insure the most uniform castings possible. It is false economy to buy such repairs of job foundries or other outside sources of supply.

Customers who purchase of us avoid the troubles incident to misfits, hard castings and the resultant bad cloth in the weave room.

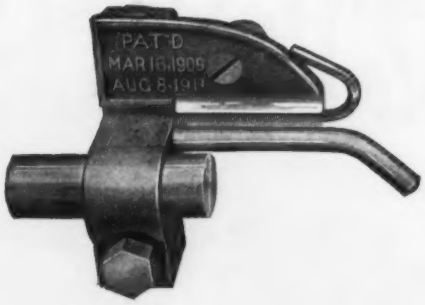
We carry several hundred tons of finished loom repairs in stock for the convenience of our customers.

DRAPER COMPANY

HOPEDALE, MASS.

J. D. CLOUDMAN, Southern Agent

40 South Forsyth Street, Atlanta, Georgia



THE MacColl Patent Spooler Guide

will, with a much more open setting, remove slubs or bunches that would pass through other spooler guides;
it will allow small piecings and knots which are unobjectionable to pass through;
it will pluck loose slubs and imperfections from the yarn without breaking, holding the slubs, etc., in the teeth until they are cleaned;
it is easily set, cleaned and adjusted;
as it works with a larger opening it requires less frequent adjusting than other guides.

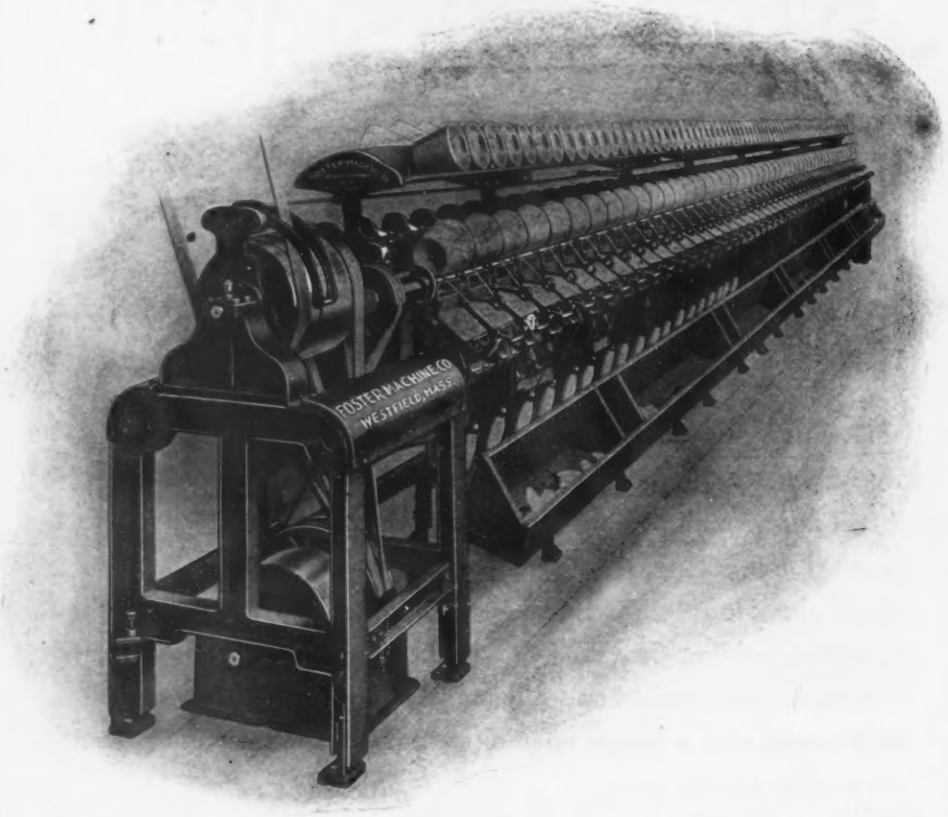
On worsted yarns the production in after processes is greatly increased, as the yarn is delivered practically free from slubs and it is unnecessary to stop continually to remove these imperfections.

DRAPER COMPANY

HOPEDALE, MASS.

J. D. CLOUDMAN, Southern Agt, 40 So. Forsyth St., ATLANTA, GA.

The Foster Cone Winder



The cone package has attained its present favor through the extension of the use of the Foster Cone Winder.

Foster finishing has eliminated cobwebbed cones, ribbon wind chafing, loose ends and guide rubbed cones.

75 per cent of all the knitting yarns produced in the United States are wound on this machine.

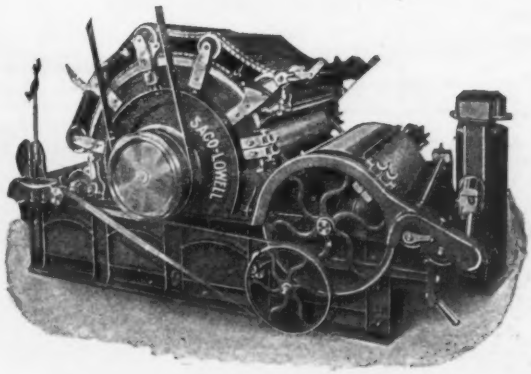
Foster Machine Company

Westfield, Mass.

John Hill, *Southern Agent,* 3rd National Bank Building, Atlanta, Ga.

Saco-Lowell Shops

TEXTILE MACHINERY



Shops—
Lowell, Mass.
Biddeford, Maine
Newton Upper Falls, Mass.

Executive Offices—
77 Franklin Street
Boston, Mass.

Southern Agent, ROGERS W. DAVIS,
Charlotte, N. C.

COMPLETE COTTON MILL EQUIPMENT
Including:
Pickers
Cards
Drawing
Evener Drawing
Roving
Spinning
Twisters
Slashers
Spoolers
Winders
Warpers
Looms

WASTE RECLAIMING MACHINERY

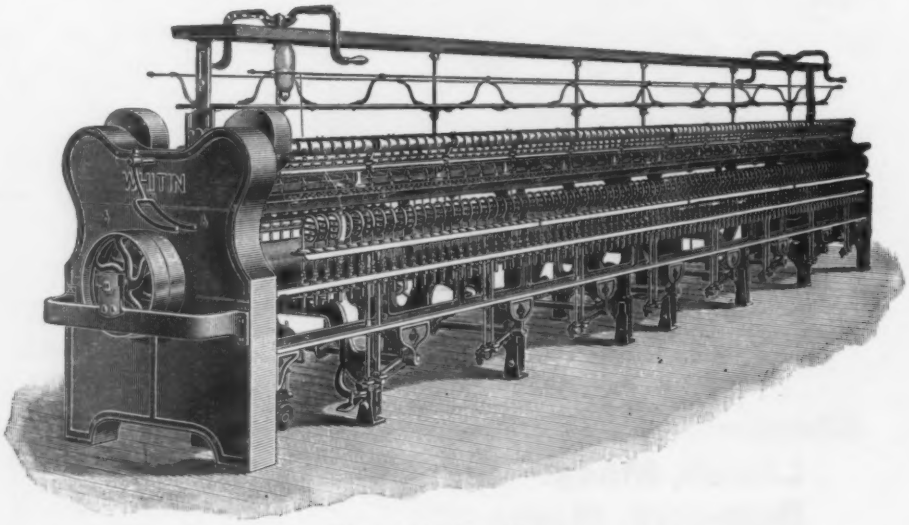
WORSTED MACHINERY
Including:
Revolving Reels,
Gill Boxes
Drawing Frames,
Reducing and Roving Frames,
Cap Ring and Fly Spinning and Twisting Frames
Jack Spoolers

The Whitin Machine Works

Whitinsville, Mass.

BUILDERS OF

Cotton Mill Machinery



Ring Spinning Frame

CARDS
COMBERS
DRAWING FRAMES
ROVING FRAMES
SPINNING FRAMES
SPOOLERS
TWISTERS
REELS
LONG CHAIN QUILLERS
LOOMS AND DOBBIES

Southern Agent: STUART W. CRAMER, Charlotte, N. C.

The Largest Alpaca Mill in America

Your business is operating a mill, so there is no particular reason why you should take the responsibility of the size of the humidifying equipment to be furnished.

Therefore, insist upon having a guarantee to give you the required results during all seasons.

The Carrier System is guaranteed to give the required results continuously — temperature as well as humidity.

Carrier Air Conditioning Co.

Of America

No. 39 Cortlandt Street, New York City

NEW ENGLAND
E. T. Lyle, 1862 Beacon St.
Brookline, Mass.

CHICAGO
Ft. Dearborn Bldg.
Clark and Monroe Sts.

PHILADELPHIA
732 Real Estate Trust Bldg.

BUFFALO, 490 Broadway

LEIGH & BUTLER

SUCCESSORS TO

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENTS

IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber — will comb from 7-8″ stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.
Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

MATHER & PLATT, LTD.

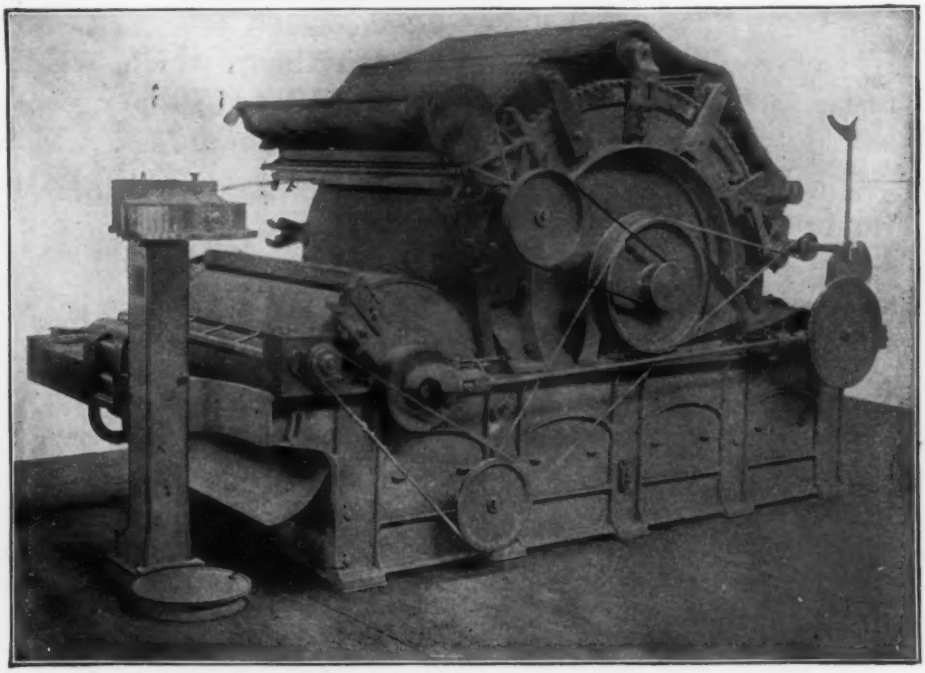
Dyeing and Finishing Machinery.
Archbutt-Deeley System for purifying and softening water.

JOSEPH SYKES BROS. Card Clothing for Cotton.
JAMES CRITCHLEY & SONS. Card Clothing for Woolen and Worsted.
WILSON BROS. BOBBIN CO. Bobbins, Shuttles, Etc.
THOMAS B. HAIGH. Double Loop Bands, Spinning Tape, Etc.
DRONSFIELD BROTHERS. Grinding Machinery and Emery Filleting.
HARDING'S Fallers, Pins and Circles.
The Best French and English Combing and Rubbing Aprons.
Card Flats reclothed and Lickers-in rewound.

MASON MACHINE WORKS

Taunton, Mass. **Greenville, S. C.**

Builders of
Revolving Flat Cards, Drawing Frames,
Spinning Frames, Looms, Dobbies, Etc.



Superior Loom Cranks for Repairs

If you could buy a barrel of anything which would increase the light in your factory 19 to 36 per cent, wouldn't you seriously consider its purchase?

You will gain 19 to 36 per cent actual increase in light if you paint the interior of your factory with

Rice's Mill White

Rice's Mill White is an oil paint, not a cold water paint. It is the only **oil** paint giving a **glossy,** tile-like surface which will not crack or craze.

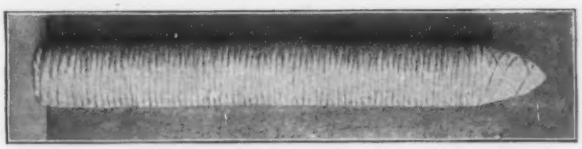
Rice's is the *original* "Mill White" paint, made by a process which no other paint manufacturer can use. No imitation has the *lasting* qualities of Rice's Mill White.

Rice's Mill White Paint is sold direct, in barrels containing sufficient paint to cover 20,000 square feet, one coat. If you have that area of ceiling and wall space to cover—

Write for Booklet and Sample Board

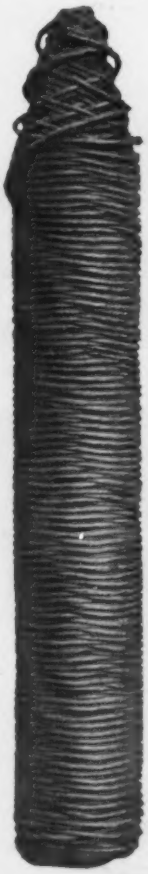
Ask for a copy of our Booklet, "More Light." Write today.

U. S. GUTTA PERCHA PAINT CO., 20 Dudley St., Providence, R. I.



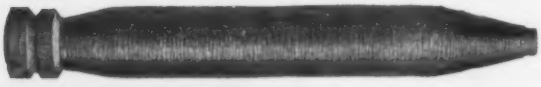
No. 2

No. 1 and No. 2—Cops to weave from inside seven-eighths to three inches diameter and up to seventeen inches long. Suitable for various kinds of coarse goods such as grass matting, cotton bagging, cocoa matting, all kinds of carpets, felts, chinchilla, linen, jute, flax, asbestos, hose and narrow fabrics such as wicks, belting, webbing, surcingles, halters, etc.



No. 1

No. 3 and No. 4 Shuttle Bobbins from seven-eighths to two inches in diameter and any length up to twelve inches. Suitable for all kinds of duck, upholsteries, tapestries, asbestos, ratana or any kind of fancy yarns for automatic or other looms.



No. 4

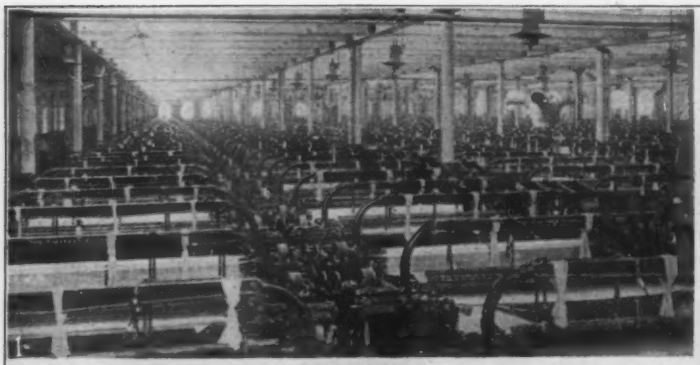
No. 3

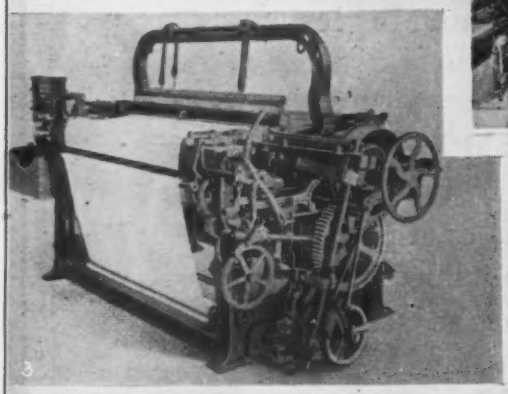
OSWALD LEVER CO., Inc.

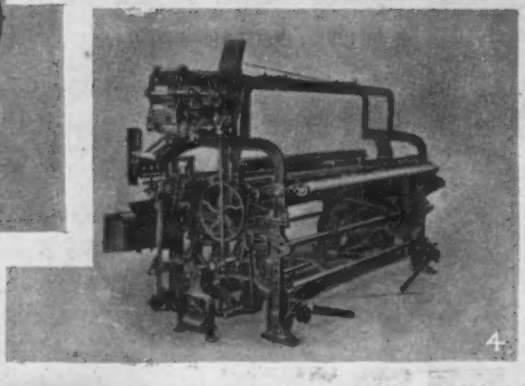
Lehigh Avenue and Front Street, Philadelphia, Pa.

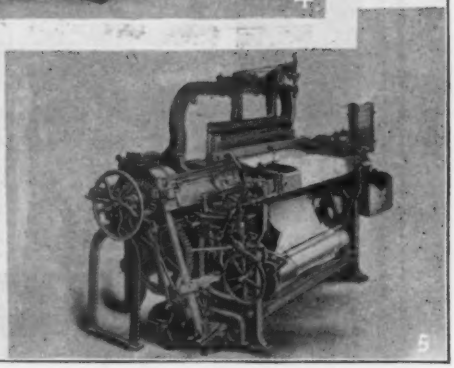
Builders of Textile Machinery

WINDERS ESPECIALLY









1—Riverside & Dan River Cotton Mills, Danville, Va.

2—Wampanoag Mills, Fall River, Mass.

3—Plain Goods Loom.

4—Worsted Loom.

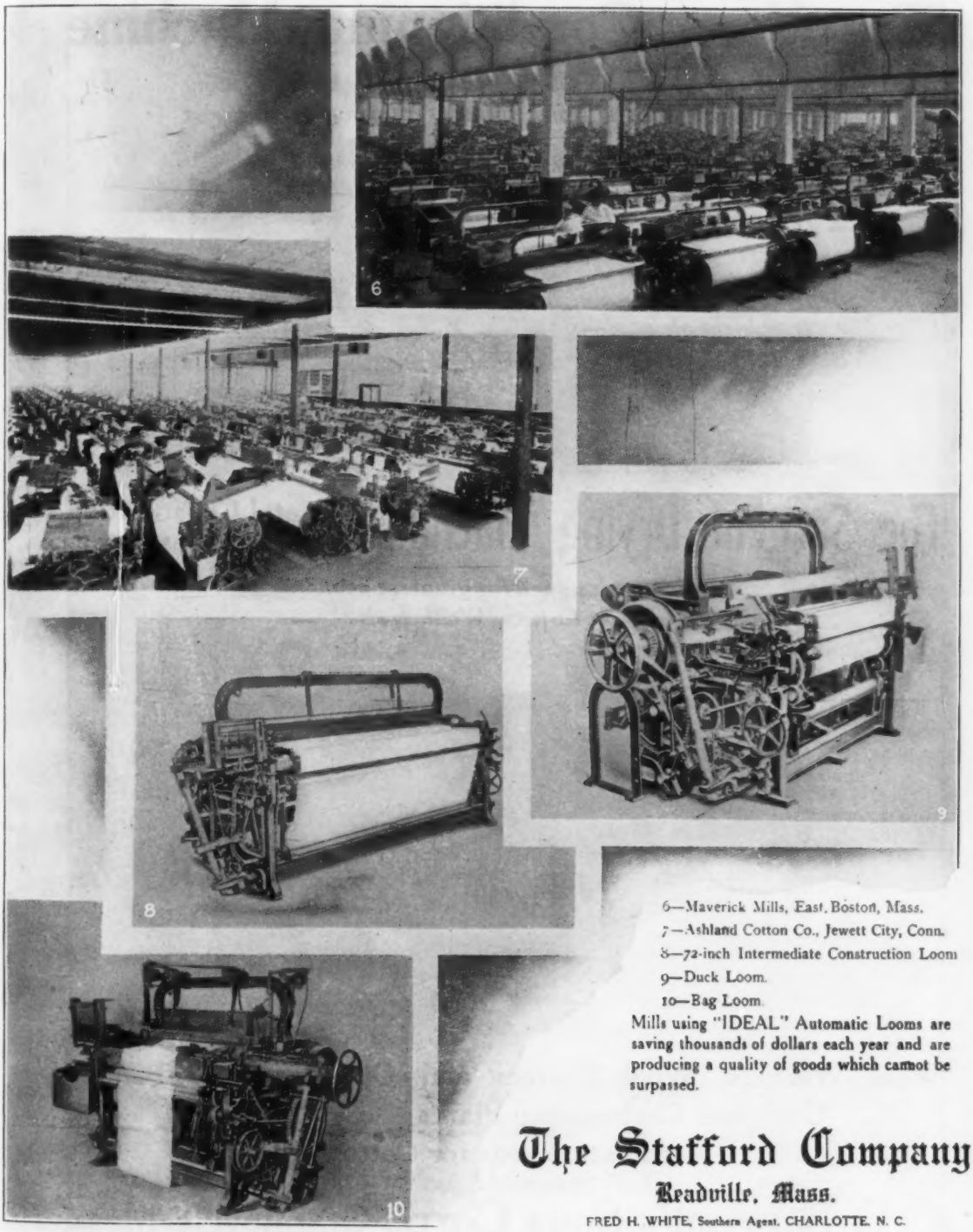
5—Pillow-tube Loom.

Typical weave rooms containing "IDEAL" Automatic Looms and some recent loom models

The Stafford Company

Readville, Mass.

FRED H. WHITE, Southern Agent, CHARLOTTE, N. C.



6—Maverick Mills, East Boston, Mass.
7—Ashland Cotton Co., Jewett City, Conn.
8—72-inch Intermediate Construction Loom
9—Duck Loom.
10—Bag Loom.

Mills using "IDEAL" Automatic Looms are saving thousands of dollars each year and are producing a quality of goods which cannot be surpassed.

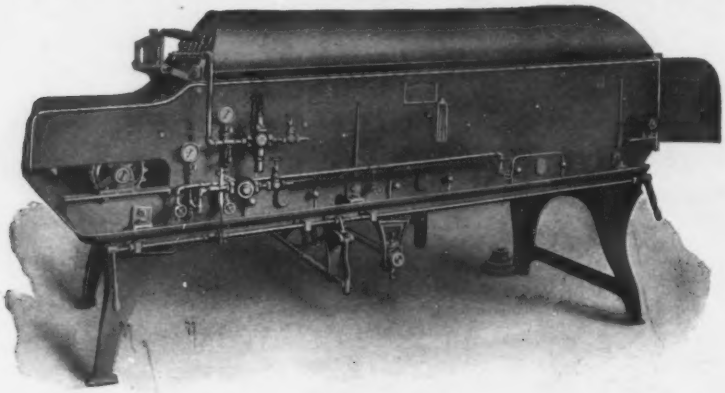
The Stafford Company

Readville, Mass.

FRED H. WHITE, Southern Agent, CHARLOTTE, N. C.

The Yarn Conditioning Machine

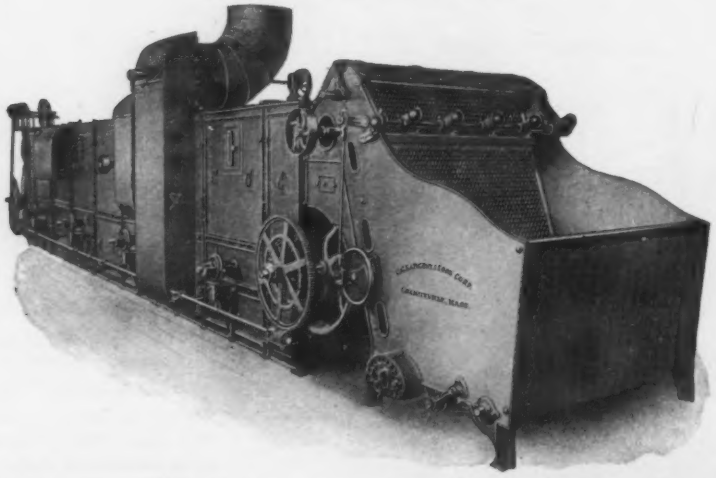
Sets the twist in your filling and overcomes kinky filling difficulties. It conditions without injuring the bobbins



The Sargent Drying Machines

Metal Construction
Asbestos Insulation

Scientifically designed for greatest economy in drying Cotton, Wool, Hair.



Wool Washers, Wool Dusters and Openers, Burr Pickers
Complete Carbonizing Plants
Automatic Feeds for Cotton and Wool

C. G. Sargent's Sons Corp., Graniteville, Mass.

FIG.20.

Oblong Style

Heavy, strong cotton duck. Leather binding. Full length frame pockets. Handles securely fastened. Renewable hardwood shoes. Made also with iron shoes (Fig. 38) dragged but little.

Lane Canvas Mill Baskets

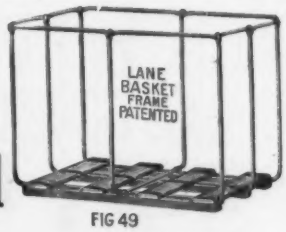


FIG 49

Lane Basket Frame

Round spring steel. Uprights fastened to hoop by *flexible eyejoints*, guaranteed against breakage. Light and exceedingly strong.

Boxes and Trucks

Essentially

Profit Makers

Lane	*Others*
Smooth, flexible surfaces	Nails, splinters, unyielding
ELIMINATE WASTE	**MAKE WASTE**
Light Weight	Heavy and Clumsy
GREATER HELP EFFICIENCY	**UNNECESSARY FATIGUE**
Life measured by years	Their days are numbered
LOW ULTIMATE COST	**HIGH YEARLY EXPENSE**

Why not line up in the Lane Column?

FIG.27

Lane Truck

Made as shown, or *with Duck Partition*. Mounted on stationary frame casters, with *thread guards*, as above, or on swivel frame casters.

"A Style for every use"

Write for Catalog and Prices

W.T. Lane & Bro.

Manufacturers

Poughkeepsie, N.Y.

FIG.22.

Round Taper

Materials and construction same as Fig. 20. Made also with iron shoes (Fig. 38) if desired.

THE TURBO--HUMIDIFIER HANDED ONE MILL THIS

If in doubt whether an installation of Turbo-Humidifiers will pay you in dollars and cents, here is some food for thought.

"We take pleasure in advising you that the Turbo-Humidifiers which you have installed in our plant work to our full satisfaction. Knowing the trouble with other systems, the simple construction of your system appealed to us and we are glad that we ***picked out a good thing.***"

And here is another letter about the

TURBO-HUMIDIFIER

(*The Humidifier with the Guarantee*)

"Since we installed your system, our ***production has increased over 10%.*** The day we started up the Humidifiers we worked under very unfavorable conditions, yet within two hours after starting up, our machinery was turning out production to its full capacity."

Yes, we can show you stacks of other letters just as good as these.

Humidifying a textile mill does not insure a 10% increase of production in every case, but enough mills have increased their production from 2% to 10% to warrant your investigating this subject very carefully.

Just tell your stenographer to write for a Catalogue, for a visit by one of our engineers, or both.

THE G. M. PARKS COMPANY

Fitchburg, Mass.

Southern Office, 32 West Trade St., Charlotte, N.C .B. F. Cottrell, Mgr.

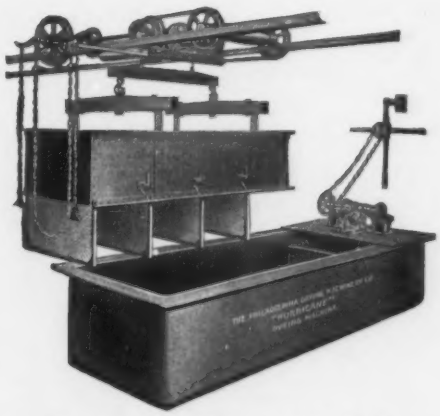
Dyeing Machinery

For

Hosiery,

Skein Yarn,

Slubbing, etc.



BETTER

Dyeing

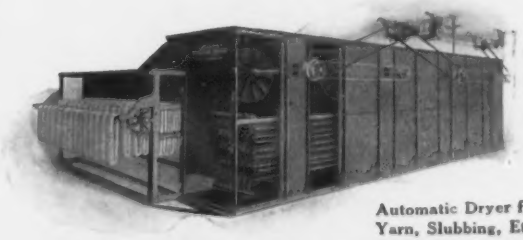
AT

Less Expense

The **BEST** and
Most Economical
Dyeing Machine

Give us an
Opportunity to
Prove our claims

"Hurricane" Circulating Dyeing Machines are built in various sizes and types



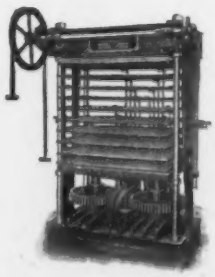
Automatic Dryer for
Yarn, Slubbing, Etc.

COMPLETE EQUIPMENTS FOR

DYEING
SCOURING
BLEACHING
CARBONIZING

FIRE-PROOF DRYERS

Steel Construction,—Insulated with Asbestos



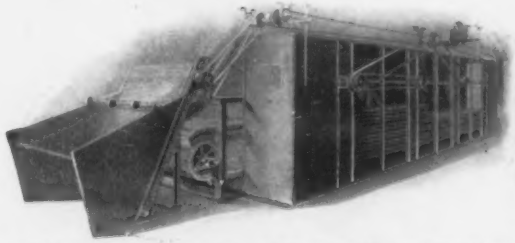
Power Screw and Hydraulic PRESSES

FANS

MOTOR

AND

BELT-DRIVEN



AUTOMATIC STOCK DRYER

(With Sectional-Continuous Conveyor)

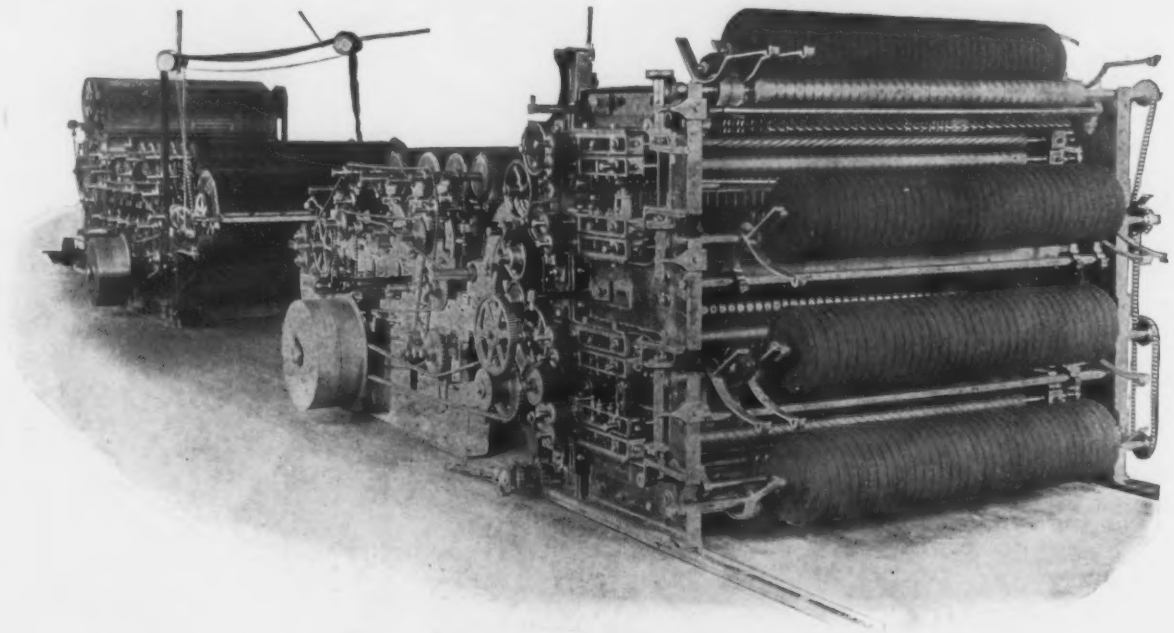
For Cotton, Wool, Hair, Rags, Etc.

THE PHILADELPHIA DRYING MACHINERY CO.

Main Office and Works:
6721 Germantown Ave., Philadelphia, Pa.

Boston Office:
53 State Street

New System of Waste Carding a Revelation



SPECIALLY ADAPTED FOR

COTTON WASTE SHODDY WOOLS

Remarkable Increase in Production Over Old Methods

Woonsocket Machine & Press Co. =:= Woonsocket, R. I.

THOMAS LEYLAND & CO.

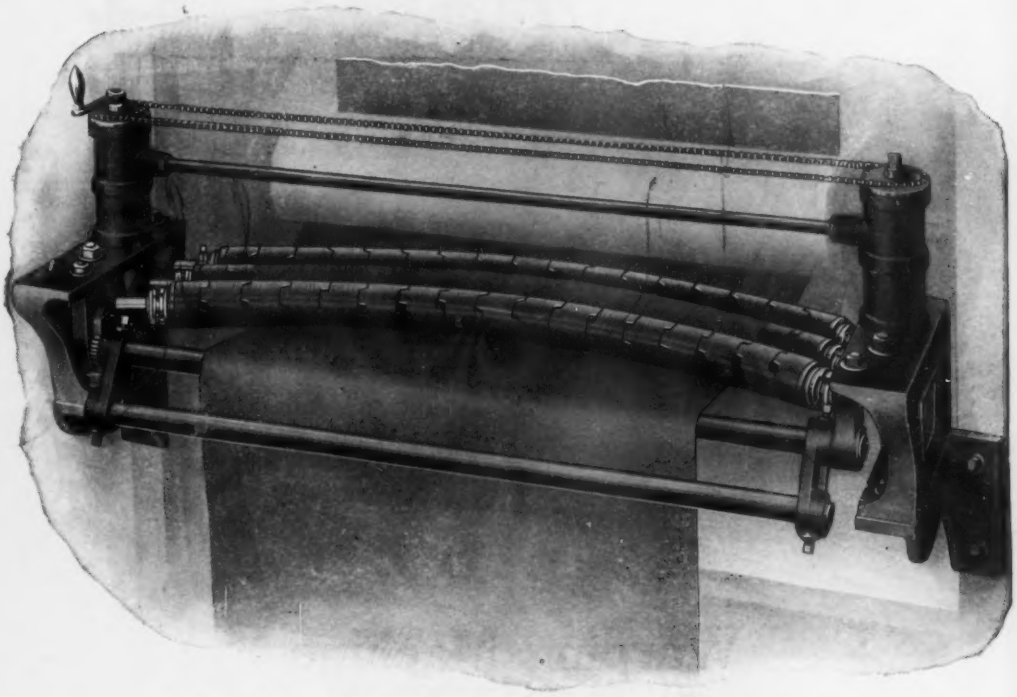
60 India Street, Boston, Mass.

F. T. WALSH, Manager

Sole Manufacturers of THE WILLIAM MYCOCK

Improved Regulating Cloth Expander

PATENTED

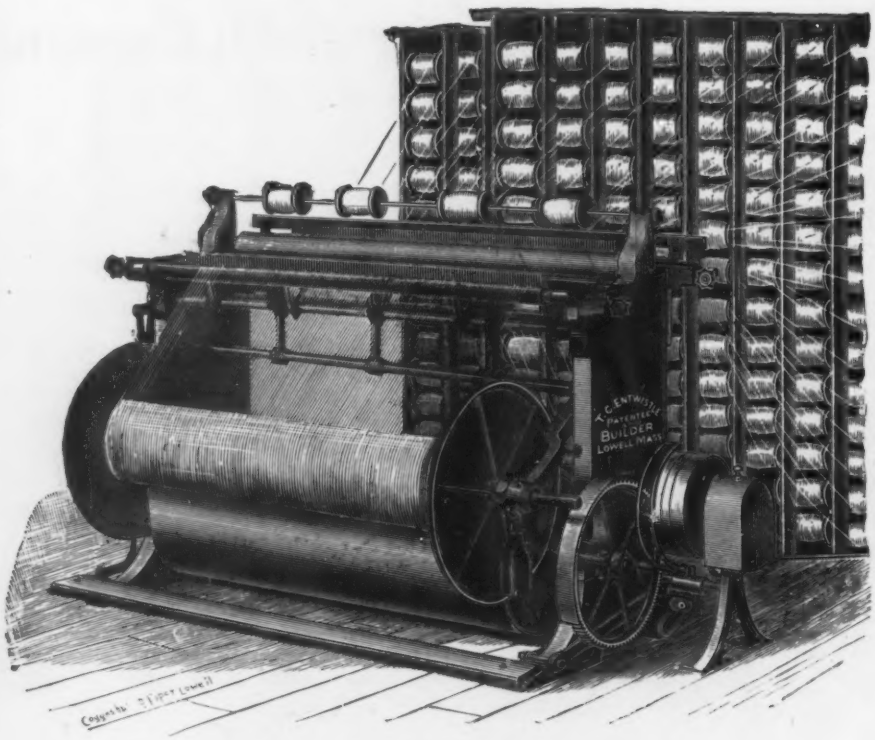


Expander attached to Calendar showing Regulating Motion and Adjustable Tension Bars

Scutchers, Sewing Machines, Open Bleaching Machines, Blanket Washers for Calico Printers, Guides, Etc.

WORKS AT READVILLE, MASS.

Cotton Machinery by Specialists



Warping Machine

T. C. Entwistle Co.

Southern Representative:
J. H. MAYES, Independence Bldg.
Charlotte, N. C.

Northern Representative:
WM. V THRELFALL, Marshall Bldg.
Boston, Mass.

Cotton Machinery by Specialists

Pickers and Revolving Flat Cards

POTTER & JOHNSTON MACHINE CO.

Pawtucket, R. I.

Drawing and Roving Machinery

WOONSOCKET MACHINE & PRESS CO.

Woonsocket, R. I.

Ring Spinning and Twisting Frames

FALES & JENKS MACHINE CO.

Pawtucket, R. I.

Spoolers, Winders and Reels

EASTON & BURNHAM MACHINE CO.

Pawtucket, R. I.

Warpers and Beamers

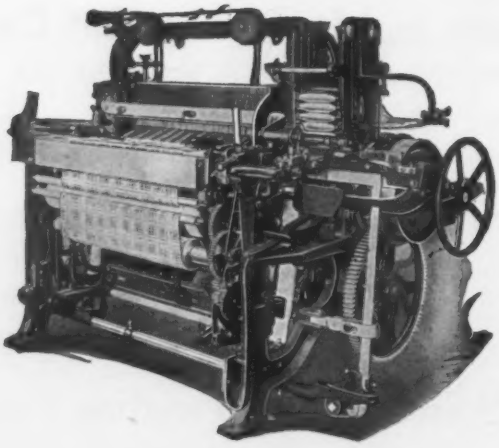
T. C. ENTWISTLE CO.

Lowell, Mass.

Southern Representative:
J. H. MAYES, Independence Bldg.
Charlotte, N. C.

Northern Representative:
WM. V. THRELFALL, Marshall Bldg.
Boston, Mass.

Crompton & Knowles Loom Works



Automatic Gingham Looms

One of our latest productions for weaving goods of two or more colors in the filling. Like every loom we build, it has the advantage of a successful mill test.

WORCESTER, MASS.

Providence, R. I. **Philadelphia, Pa.**

Southern representative, ALEXANDER & GARSED, Charlotte, N. C.

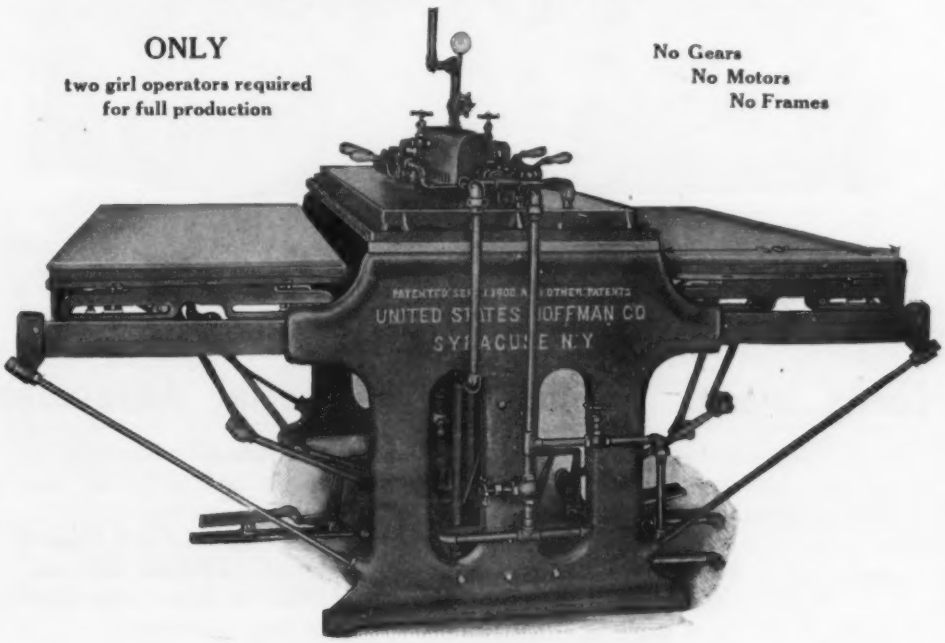
The "HOFFMAN" "FFF" Underwear Press

is the only press on the market giving the maximum amount of efficiency, both in quantity and quality of finish

STEAM HEATED HEAD AND BUCK. 72 inches long

ONLY
two girl operators required for full production

No Gears
No Motors
No Frames



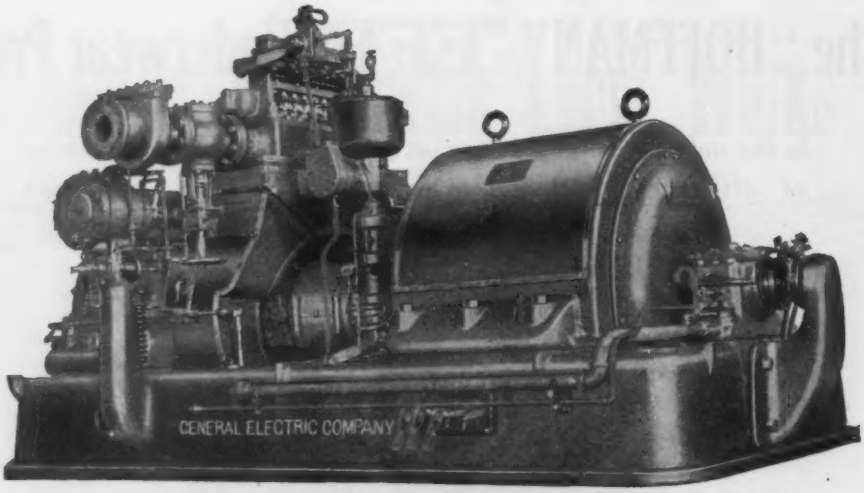
"HOFFMAN" "FFF" Underwear Press

LIVE, DRY steam brought in direct contact with the garment is what gives it the superior finish, not gotten by the use of other pressing devices.

United States Hoffman Co.

SYRACUSE, N. Y.

Write for information and terms.



Where Exhaust Steam is Used

Curtis Steam Turbines Have Special Advantages

The Turbine casing can be so arranged that low pressure steam for heating or other purposes can be extracted at the desired pressure.

The low pressure steam not so used is efficiently utilized for power generation in the low pressure end of the turbine.

When no steam is being extracted, the turbine operates with the usual high economy of a condensing machine.

Either hand or automatic devices can be furnished for maintaining uniform pressure of extracted steam.

Our representatives will gladly furnish you with additional information.

General Electric Company

Largest Electrical Manufacturer in the World

General Office: Schenectady, N. Y.

District Offices in:

Boston, Mass. New York, N. Y. Philadelphia, Pa. Atlanta, Ga.
Cincinnati, Ohio Chicago, Ill. Denver, Colo. San Francisco, Cal.

Sales Offices in all Large Cities

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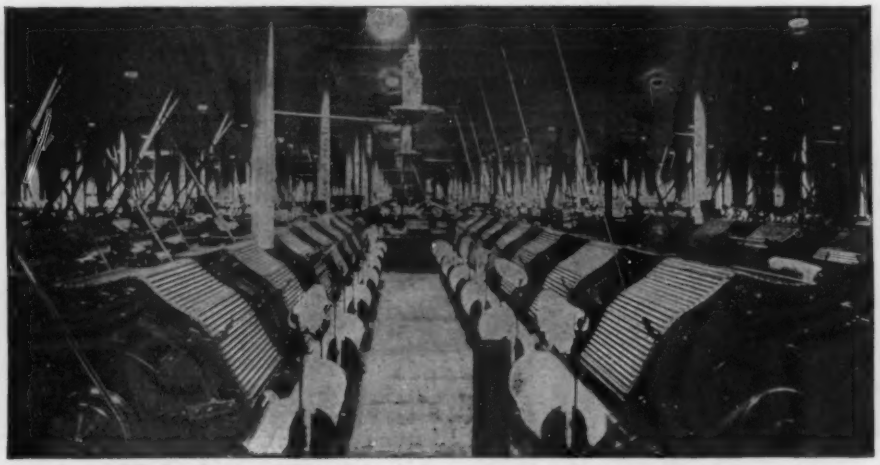


Carding Room in a Southern Cotton Mill. 75-60 watt clear Edison Mazda Lamps are used, equipped with aluminum finish intensive distribution Holophane—D'Olier steel reflectors. (A1.60)

The Most Satisfactory Lamps for Textile Mills

Mazda Lamps are now regarded as the standard illuminant for Textile Mills.

The large range of sizes renders these Lamps adaptable to all conditions and classes of service.

The strong, sturdy filaments of drawn wire withstand any reasonable amount of shock and vibration incident to textile mills.

Edison Mazda Lamps equipped with proper reflectors give an excellent distribution of light for every lighting requirement.

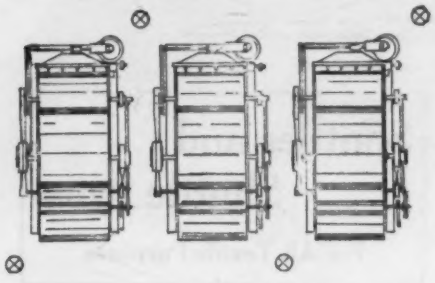
The information given in the bulletin on "The Lighting of Textile Mills" is compiled by engineers who have specialized in Textile Mill Lighting and is the result of many tests and investigations of actual conditions.

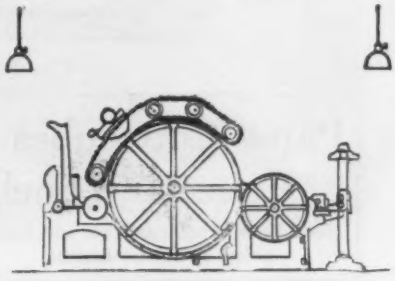
The bulletin is of vital importance to the plant superintendent, engineer and electrician. Send for your copy today.

LIGHTING OF COTTON MILLS

Carders—Light of moderate intensity must be provided at the front end to facilitate the placing of the roll of "lap" in position, and also at the rear in order that the workmen may see that the "sliver" is passing into the "coiler head" properly. The light in the aisles must be "spread" or "diffused" in order that gear adjustments or repairs may readily be made.

Methods of Lighting Carders—Fig 1 is a plain view; 40 or 60 watt clear Mazda Lamp with bowl-shaped steel reflector (extensive distribution if hung 8 feet above the floor, or intensive distribution if hung 10½ feet above floor.) Fig. 2 shows in elevation the approximate location of extensive reflectors.





Other valuable information may be obtained from the Bulletin

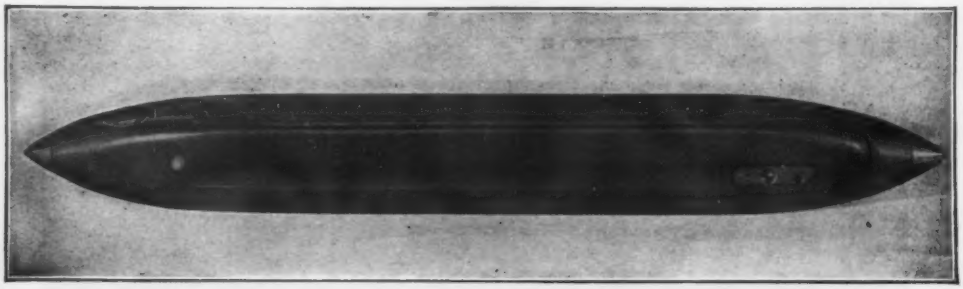
GENERAL ELECTRIC COMPANY

Edison Lamp Department Harrison, N. J.

Lamp Agencies Everywhere 4406

NEW HAND-THREADING SHUTTLE

PATENTED



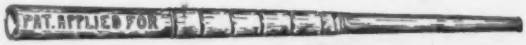
The Simplest and Most Quickly Threaded Shuttle

It can be filled with the finest silk or the coarsest filling—won't unthread when the yarn "balloons"—lint that accumulates is easily removed—felt can be inserted for tension purposes—and being a hand threading shuttle, it is sanitary.

Use Never-Slip Cop Spindles and Tubes

And Do Away With All Filling Waste

With this combination we will guarantee that you can run your looms with longer cops and at much higher rate of speed than is otherwise possible.



Never-Slip Cop Tube

Paper Cop Tubes Cones and Shells

Send Your samples and we will quote prices on any lot desired

Shuttles and Shuttle Irons

For All Textile Purposes

Trial orders solicited—Satisfaction guaranteed

American Textile Specialty Machinery Co.

670 Eddy Street - Providence, R. I.

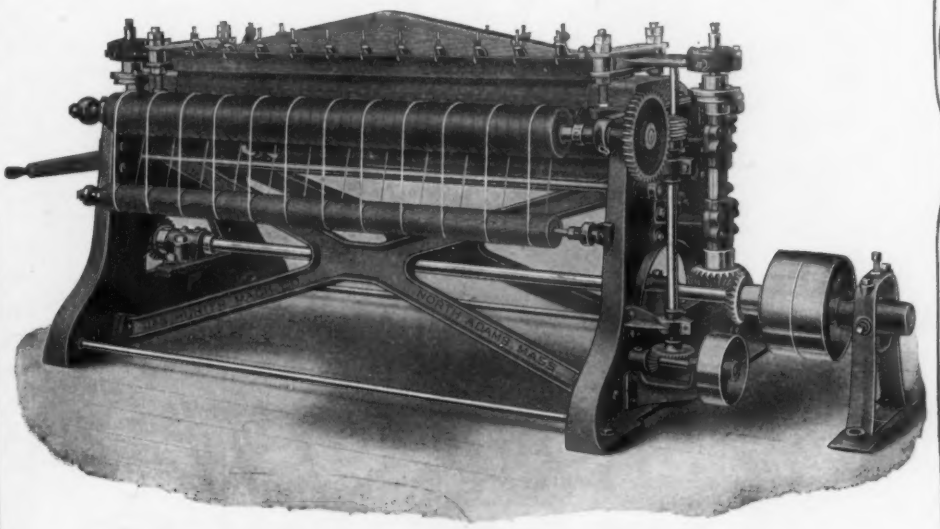
13th St. and Boulevard, Long Island City

JAMES HUNTER MACHINE CO.

NORTH ADAMS, MASS., U. S. A.

CHINCHILLA MACHINE *Bulletin No. 76*

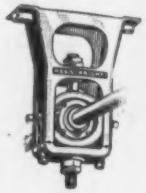
The Hunter CHINCHILLA, NAPPING OR RIPPLING MACHINE



FOR RIPPLING, WAVING OR CURLING THE NAP ON RAISED FABRICS

BALL ~ BEARINGS

HB DWF



The Hess-Bright Manufacturing Company

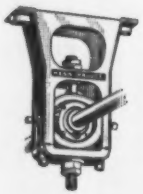
Pioneers in the introduction of Annular Ball Bearings

Most extensive resources and plants in existence devoted exclusively to ball bearing manufacture

Main Offices and Plant No. 2 on line of Penna. R. R. to New York

No. 27 E. Erie Ave., Philadelphia, Pa.

A Line in Your Plant is a Convincing Argument



PHILADELPHIA	NEW YORK	CHICAGO
666 North Broad Street	1974 Broadway	1800 Michigan Avenue

HESS BRIGHT HB

HESS BRIGHT HB

Said a Critical Buyer:

"I don't know much about electric motors but I do know something about gearing. I see you equip with NEW PROCESS PINIONS. I have invariably found these the best and consider their use here a good recommendation for the rest of your machine. I'll buy."

Tell us about your own product and we will tell you what benefits would be assured to your customers by the substitution of New Process for metal pinions. Write for book "Noiseless Gear Driving."

NEW PROCESS IS TO ALL OTHER RAWHIDE AS STEEL IS TO IRON

N.P.R.H. NEW PROCESS GEAR CORPORATION N.P.R.H.

SYRACUSE, N.Y.

Canadian Agents: Robert Gardner & Son, Ltd., Montreal

Starch

THE particular case of your own mill needs careful study to determine what starch is best suited to *your* SIZING and FINISHING problems.

We have reduced the manufacture of starches for textile work to a science by years of factory investigation and laboratory research. We are ready to take up the special case of your mill and point out to you what starches are most adaptable and reliable for your purposes.

Six years of careful investigation of conditions in the cotton mills of the country has taught us the needs of the trade.

Six years' research in the best equipped Starch Laboratory in America has put us in touch with starch chemistry.

Six years of manufacturing, with cotton mill problems in mind, has produced our special Brands of Textile Starches.

We want to send our special starch expert to your mill. We want him to go into the matter of sizing with your boss of slashing—check up your sizing processes—find out whether you are now using the starches that will insure you the most efficient and economical results.

This special starch expert service is absolutely free—send us a sample of the starches you are using. We will give you an exact analysis of them and send our practical man to study your needs. Write a letter now to our Mill Starch Department.

Corn Products Refining Company
NEW YORK

Starch

Economy in Textile Manufacture

SEASONABLE SUGGESTIONS

Would Economy in the Operating of Your Heating System the Coming Winter Interest You?

Are you going to operate it as in the past, leaving the control of the various radiators, coils and dampers, to the attention or neglect of one man, with the resultant extremes of temperature.

We believe we can make the subject interesting to you, and at a comparatively small expense make a reduction in the cost of the heating of your mill.

Human control is NOT DEPENDABLE, and is never as accurate as AUTOMATIC CONTROL. With the approaching heating season will recur all the old troubles you have experienced in the past, which may be overcome by the adoption of our THERMOSTATIC CONTROL throughout your mill, as a whole, or in such departments as may have caused you some special annoyance or excessive cost in heating.

Applicable to all Classes of Heating Systems.
Absolutely Positive in operation, and **Entirely Reliable** under any and all conditions.

Some of the advantages in favor of AUTOMATIC CONTROL are:

ECONOMY IN SAVING OF FUEL
SIMPLE IN CONSTRUCTION
COMFORT OF INDIVIDUALS
PREVENTS DAMAGE TO PRODUCT

HUMIDIFYING

Presumably *you have* some kind of a

HUMIDIFYING SYSTEM

If you have not however, communicate with us AT ONCE. DO IT NOW.

Does it give the most SATISFACTORY RESULTS? Why not adopt our

AUTOMATIC CONTROLLER?

Positive and reliable; entirely automatic; an instrument of precision, and applicable to

SYSTEMS ALREADY INSTALLED

We are Specialists in Humidification

Let our Engineer look over your Heating and Humidifying System, and quote on the cost of installing a System of AUTOMATIC TEMPERATURE and HUMIDITY REGULATION adapted to your requirements.

Correspondence Solicited

American Moistening Company

BOSTON, MASS., U. S. A.

WILLIAM FIRTH, President **FRANK B. COMINS, Vice-President and Treasurer**
Southern Representative, JOHN HILL, Third National Bank Building, Atlanta, Ga.

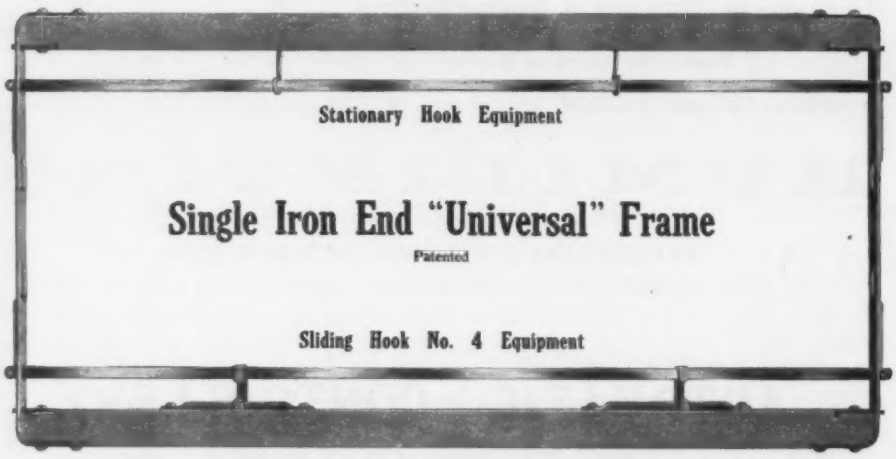
To Add A Penny To Your Profits Take A Penny From Your Costs

The old way to increase profits was to rob the quality of the merchandise—to steal from the goods without reducing the selling price. Such methods today would spell ruin to a firm attempting them.

The only sure way—the most satisfactory way to increase profits is to cut your operating costs—to eliminate all lost motion—to train labor and last but by no means least—TO BUY EQUIPMENT THAT WILL GIVE THE BEST SERVICE FOR THE LONGEST POSSIBLE PERIOD.

To buy equipment that will continue giving this service without the necessity of constant repair and the consequent costly attention of the operator.

What—if such equipment does cost a few pennies more at the start? What are a few pennies when the equipment you buy will outlast the cheaper equipment ten to one. We refer now to the Universal Frames made in a factory that maintains a high standard of efficiency—a factory that buys on the basis of merit—not competitive bids and the "lowest price."



The Universal Frame is made for any kind of work on any loom

It is merely a question of knowing what you make and how many frames you use—send us that much on a post card and we will show you how the Universal Frame will enable you to overcome your loom troubles—add to the quality of your product—increase production and CUT your operating costs all at one time.

Its a big broad statement—but we can prove it.

Steel Heddle Manufacturing Company

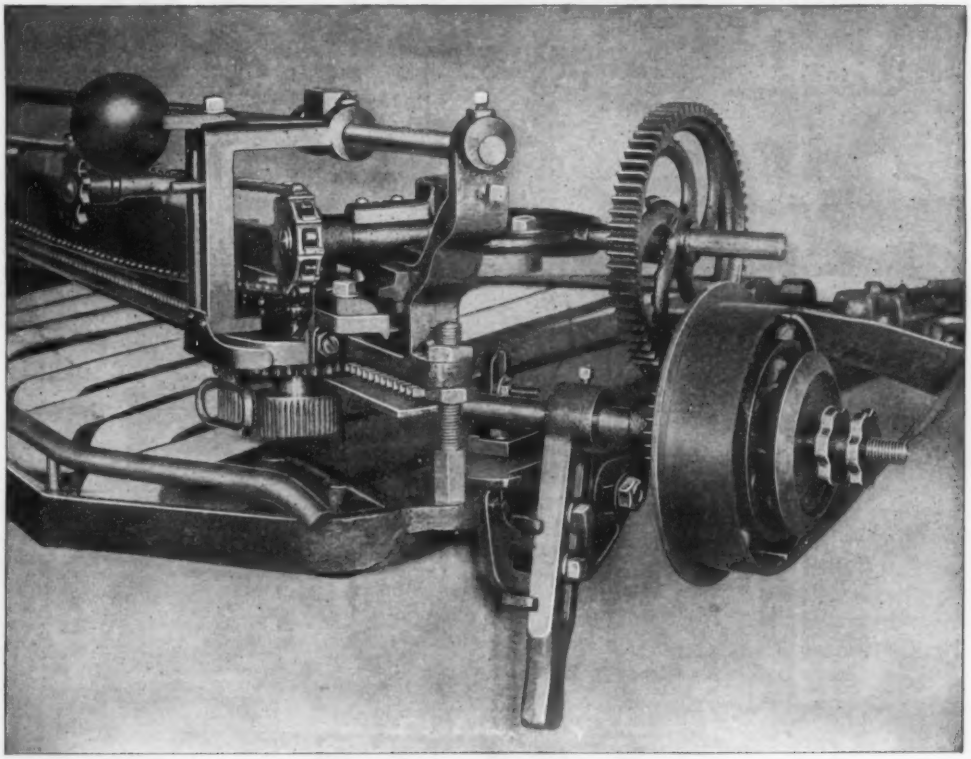
First Makers of "Efficiency" Heddles and Frames

2100-2118 W. Allegheny Avenue Philadelphia, Pa.

Providence Office:—76 Dorrance St., Providence, R. I.

The Geb Patent Tension Controller

FOR APPERLY FEEDS **WILL EXPAND 1½ INCHES**



Patented Nov. 26, 1907; Dec. 20, 1910

An Efficient Device for Changing Speed of Traveller Without Stopping Card or Apperly Feed

We take pleasure in calling the attention of woolen manufacturers and other users of diagonal or intermediate card feeds to the above attachment. The chief advantages are as follows:

1. NO MORE STOPPING CARD to adjust traveller speed.
2. NO MORE BOTHER, INCONVENIENCE AND DELAY in putting laggings of leather, yarn or twine on the traveller pulley or taking them off.
3. INCREASE OF PRODUCTION by reason of the cards running continuously. The tension on the drawing or sliver can be KEPT RIGHT and therefore the drawing will break seldom or never, and if it does break it will take much less time than heretofore to start and readjust speed.
4. BETTER WORK FROM CARDS. When the tension on drawing or sliver is wrong, a bad feed is the result and uneven yarn. With this attachment the tension can be kept just right.
5. REDUCTION IN WASTE. Wrong tension, causing breaking of sliver, or bad feeds, makes waste. This is eliminated.

Practically without exception the manufacturers who have tried this device have unqualifiedly approved same. We have never seen such a unanimous lot of testimonials about a new thing. We believe that it meets a long-felt want and that it will soon be universally recognized as indispensable.

The attachment consists of an expanding pulley permitting a change of 1½ inches in diameter by simply turning a hand wheel or nut without stopping feed, and of a specially constructed bracket which will fit easily on any intermediate feed and allows a change in the position of the pulley to take up slack in belt (or the opposite), caused by change in diameter of pulley. All the parts are substantially made and the pulley is provided with a flange to keep belt from slipping off.

We solicit your order to equip your APPERLY feeds with this attachment. It will pay for itself many times over in a short time.

GEO. S. HARWOOD & SON, 53 State Street, Boston, Mass.

Cramer System
of
Air Conditioning

Cramer "High Duty" Air Conditioner

Cramer Automatic Regulator

FACTS

In several large mills equipped with humidifiers of other makes, we have entirely reorganized their system, installing our "High Duty" equipment with automatic humidity and temperature control and the average improvement during the succeeding twelve months test is:

A—Seconds reduced over 50%.
B—Production uniform day after day (No big jumps.)
C—Actual waste account halved.
D—Large saving in "invisible waste."

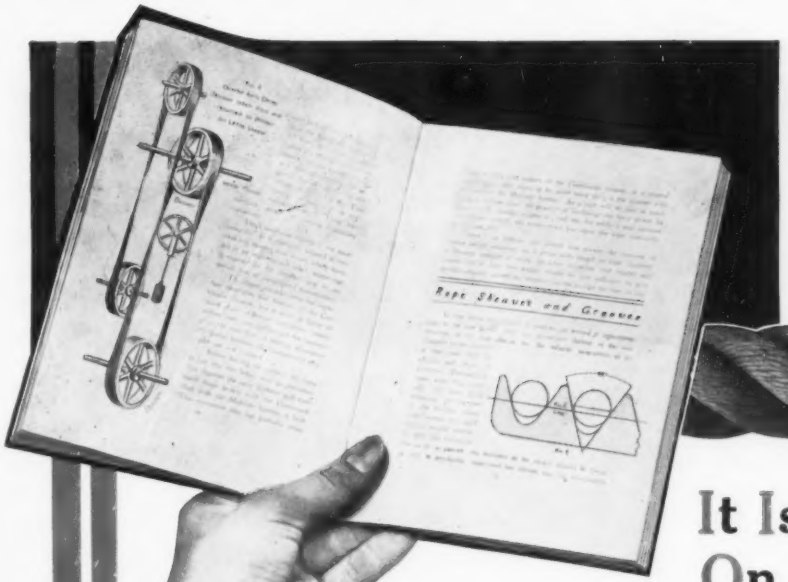
What Would Similar Results Be Worth To You?

STUART W. CRAMER

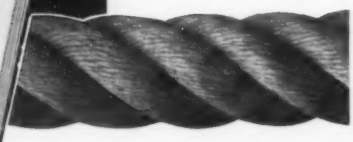
50 Church St.
New York

Charlotte, N. C.

Tremont Bldg.
Boston, Mass.



You'll Enjoy This Book



It Is Yours On Request

¶ It is the Blue Book of Rope Transmission. It does not talk about American Transmission Rope altogether; but about rope transmission as a solution of transmission problems and the many ways of using rope to do the work of belts more economically and more efficiently.

¶ It does, however, talk enough about American Transmission to inform you thoroughly as to its quality and qualities—it tells why many big and many little plants prefer *that* rope in particular.

¶ The main thing to consider, however, is that this book is *not* just an advertisement, but is worth the while of every mechanical and plant engineer—every superintendent of power—every purchasing agent—every officer or employee of a live manufacturing plant who has his own "transmission education" and the interest of the plant he works for at heart.

Send Us Your Name Without Obligation

Your receipt of this book obligates you to nothing. You don't have to enquire further, You don't have to buy—perhaps you're not a buying force in your plant, but want to inform yourself. *However*, we do believe that the receipt of this book and its perusal will incline you to American Transmission Rope.

We Ship Without Delay—on Telegram if Necessary from either point of manufacture

American Manufacturing Co.
Dept. T, Brooklyn, New York City

St. Louis Cordage Mills
Dept. T, St. Louis, Missouri

Educational Talks On Leather Belting by the

GRATON & KNIGHT MFG. COMPANY
WORCESTER, MASSACHUSETTS

To attain maximum efficiency and economy in your plant it is absolutely essential to know all possible about belting.

Leather Belting correctly installed and properly cared for is the most efficient and economical transmission medium.

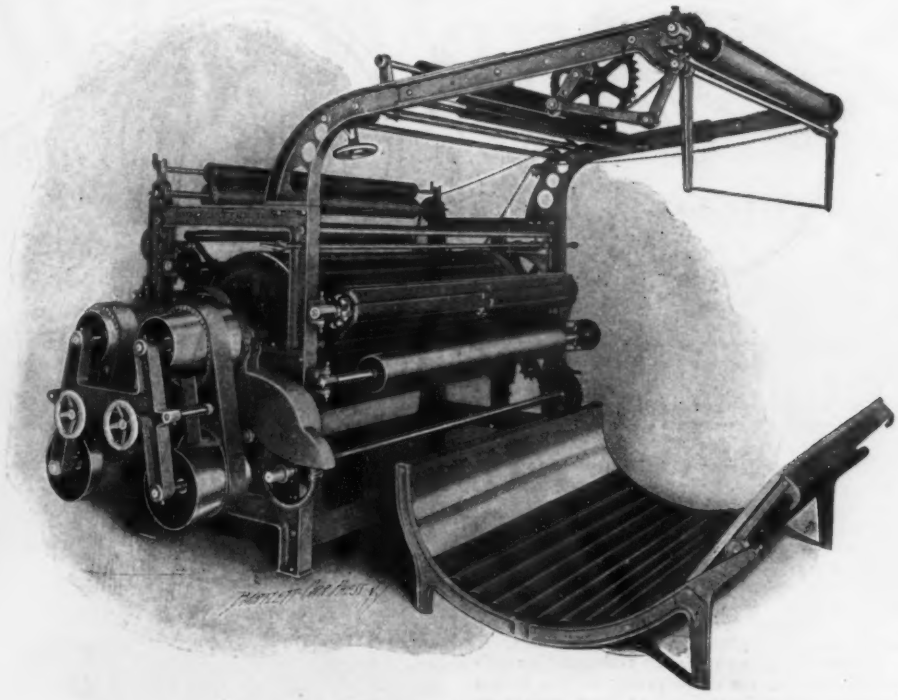
Yet it is a well known fact that belting receives very little attention for such an important factor. For this reason we intend to publish in this paper a series of educational talks on belting, its selection, its care, etc. They will be "straight from the shoulder" talks, plain, instructive and authoritative.

Our Engineering Department is at your service, consult it freely concerning your transmission problems.

1851 G&K

Subject for next month:
"What Constitutes Good Leather Belting."

Where Only "Efficiency Belts" are Manufactured



RAISE YOUR CHINCHILLAS

ON A

Parks & Woolson Napper

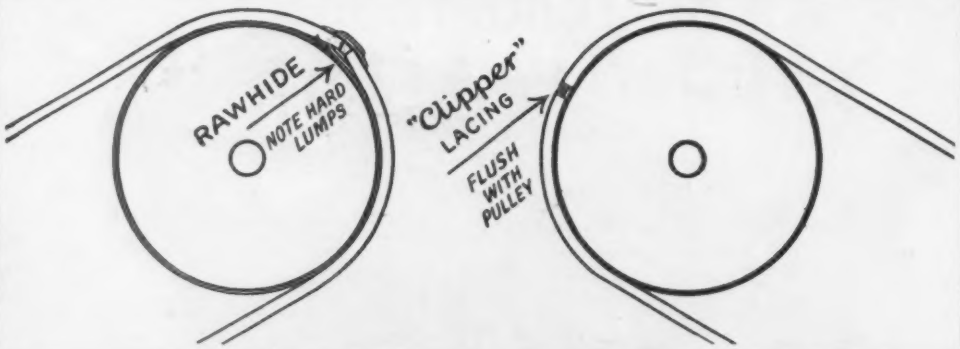
AND THEY WILL MAKE YOU PROUD

ALL KINDS OF DOUBLE-ACTING AND SINGLE-ACTING NAPPERS, BOTH BELT AND GEARED

BUILDERS OF THE FIRST BALL-BEARING NAPPER

PARKS & WOOLSON MACHINE CO

SPRINGFIELD VERMONT



"Clipper" vs. Raw Hide Belt Lacing

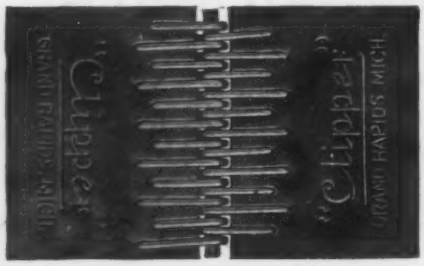
TRADE MARK

A belt's pulling power is directly proportionate to the number of square inches of contact between belt and pulley.

A rawhide lacing presents a knotted lump to the pulley-face, lifting the belt off the pulley and reducing the actual contact-surface to the very small area of the knots and strings of the lacing.

The "Clipper" lacing is flush with belt on both sides, giving full tractional efficiency.

A rawhide lacing not only reduces belt efficiency, but it costs more money for the lacing material; takes three times as long to lace as the "Clipper" method requires, and has only about half the life of a "Clipper" belt lacing. It also necessitates weakening of the belt by cutting holes in the leather.



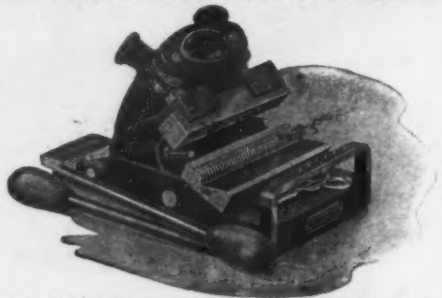
No holes are cut in leather belts by the "Clipper" method, and no fibres are cut in canvas belts, to fray out afterwards.

"Clipper" hooks are zig-zagged, thus distributing the strain on a relatively large belt surface.

Each "Clipper" hook withstands a pull of 50 lbs. or 350 lbs. to the belt inch.

The "Clipper" No. 2 Belt Lacer is a small portable machine weighing 19 lbs.

When a belt breaks, take the "Clipper" to it, set it on a stool or on the floor, insert a card of "Clipper" belt hooks in the machine, and by pushing down the handles, sink the row of hooks into the belt end. Do the same



with the other end, and secure the two ends together by passing our "Fibro" pin through the interlocked hooks.

The job is done in 3 minute and you don't have to remove the belt from the shaft

30 Days Free Trial Offer

Our dealers are authorized to deliver "Clipper machines to responsible firms, for 30 days free trial. This trial will cost you nothing, as we donate the "Clipper" hooks that you actually use.

At the end of 30 days you have the option to return the machine, or pay the dealer small sum of $15.00 for the machine and $1.50 a box for the hooks.

We are safe in making this offer because only about eight in a thousand who ever try the machine will consent to do without it from that time on.

If your dealer doesn't carry the "Clipper" line, send your order to us, with his name, so we can ship to you in his care.

Clipper Belt Lacer Co.
1010 Front Ave., Grand Rapids, Mich.

Who Wants It?

A Whole Half-Pound Stick of Stephenson Bar Belt Dressing

FREE — TO TEXTILE WORLD RECORD READERS

Economical—Efficient—Satisfactory—by Parcel Post

Give us your name and address and we'll send you *free of charge* exactly what you see in this picture—

A whole half-pound stick of Stephenson Bar Belt Dressing—the finest belt dressing made

Hundreds will write for *their* sticks and *you* want to be one of them.

A single test with the stick we send you will open your eyes. You'll up and say: "*That's some dressing, believe me!*"

The instant you touch the stick to the belt you'll notice the result. No waiting. And you can always grab up a stick, dressing at the first indication of slipping—apply it at full speed too, something you can't do in a year of Sundays with liquid dressing.

It makes no difference whether you are a convert to the sloppy can—in fact so much the better. Send us your name and address now and learn what a *real* dressing is—a wasteless, always ready, never-fail dressing. And wouldn't you like to show your employer a saving of 10% in belt expense?

A word from you and the half-pound stick is yours—*free*—if you mention the Textile World Record.

FOR SALE BY ALL RELIABLE DEALERS

STEPHENSON MFG. CO.
ALBANY, N. Y.

T.W.R. 10

NAME .....

FIRM .....

POSITION .....

MILL SUPPLY DEALER .....

PROGRESSIVE MILL MEN

Progressive mill men are always interested in methods and appliances that tend to improve conditions and reduce costs.

Recognized under this head are

The Dustless Card Stripping Apparatus

Patent Can Tramway

Firth "Indicator" Warp Stop Motion

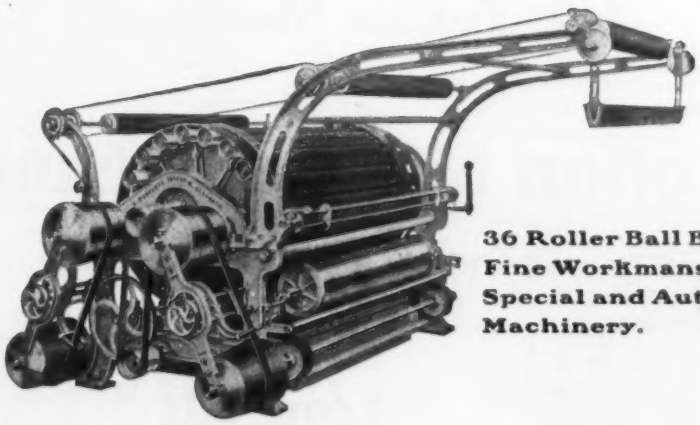
This is demonstrated by records of sales.

WILLIAM FIRTH

200 Devonshire Street **BOSTON, MASS.**

MONFORTS

Largest Napper Builder in the World



36 Roller Ball Bearing
Fine Workmanship by
Special and Automatic
Machinery.

TRY THE NEW TARIFF

ON OUR

Rotary Presses, Paul Klug Dry and Wet Decating, Fulling Machines, Tentering and Drying Machines with Automatic Electric Feeder, Cross Spool and Beam Dyeing. The new process Niederlahnstein Automatic Hank Mercerizing, Card and Napper Clothing, etc.

L. H. A. Schwartz & Co.

40 Central Street **Boston, Mass.**

BORNE, SCRYMSER COMPANY

ESTABLISHED IN 1874

Oils and Greases

For Textile Machinery

Cotton Mill Lubricants

Cylinder Oils
Air Compressor Oils
Loom Oils
Engine Oils

Spindle Oils **Dynamo Oils**

Main Office:

No. 80 South Street, New York

BOSTON **FALL RIVER** **PHILADELPHIA**

Works at

CLAREMONT, JERSEY CITY, N. J.

Whether piling in narrow aisles or lifting to the very ceiling and sliding into place—storage becomes easier. The machine also folds to go through doorways.

Are Your Ceilings Low? Are Your Aisles Narrow?

If the conditions in your stockroom are peculiar, note these photographs.

If you are up against a hard problem in piling your goods, investigate this machine.

No matter how low the ceilings, how narrow the aisles or how high the boxes must go—they can easily be raised to the required height, then rolled into place. Isn't this the quickest way—the most economical?

There is no more tugging or straining of half a dozen men—splitting of box corners or crushing of fingers. Here's a method which can be used anywhere in the plant—transported from room to room as easily as a truck,

ECONOMY·STEEL TIERING·MACHINE

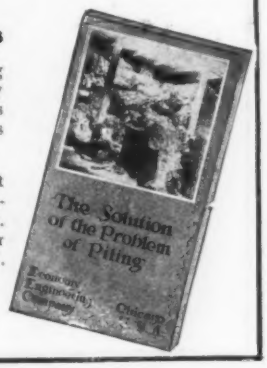
The photographs tell the story—they show the machine in actual operation. Its durable construction is plainly shown—its simplicity and ease of operation. There is no denying these *results*.

Yet boxes are only one of the many articles to which the Economy Tiering Machine is adapted. Barrels, bales, rolls of paper, machinery, castings—over 125 different kinds of products are being efficiently handled today in the world's busiest factories.

It Will Fit *Your* Needs

Over 1100 firms are now storing their products with the Economy Machine. It is built in various capacities to fit their needs—there's a type for *you*.

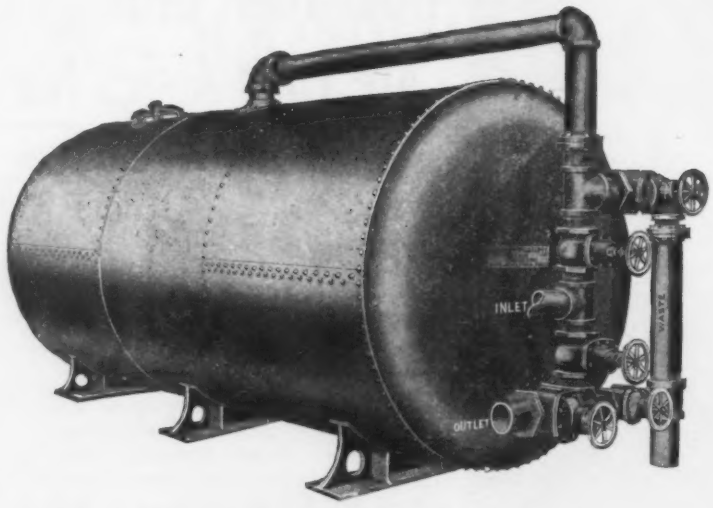
Send for our illustrated booklet which explains why Economy Machines prove a lasting investment. You will find here a solution to your storage problem. WRITE TODAY.



Economy Engineering Co., 413 S. Washtenaw Ave., Chicago

F *Parson's Trading Co., Sole Foreign Agents, New York*

FILTERS



HORIZONTAL PRESSURE FILTER

There is no question about the necessity of pure water in any textile plant. It is merely a question of the most effective and economical method of obtaining it.

We have spent twelve years in manufacturing filters capable of meeting all of the requirements of the textile trade.

By making filtration our especial study and giving our whole attention to this one subject we have perfected our system to such an extent that we are able to meet the most exacting requirements of the textile manufacturer.

Hungerford Filters having a combined capacity of one hundred million gallons per day are now in operation in the textile mills of this country and Canada.

One exclusive feature is that the filter bed never needs renewal. Doesn't this sound attractive?

A FEW CUSTOMERS

	Gals. Per Day
Dan River Cotton Mills, Danville, Va.	8,000,000
Lonsdale Bleachery, Lonsdale, R. I.	6,000,000
Newburgh Bleachery, Newburgh, N. Y.	6,000,000
Bellman Brook Bleachery, Fairview, N. J.	3,000,000
Cluett, Peabody & Co., Troy, N. Y.	3,400,000
Revolution Cotton Mills, Greensboro, N. C.	1,300,000
Cliffside Mills, Cliffside, N. C.	1,000,000
Chalmers Knitting Co., Amsterdam, N. Y.	1,000,000
Wagaraw Bleaching & Fin'g Co., Hawthorne, N. J.	1,000,000
Muscogee Mfg. Co., Columbus, Ga.	750,000
Barrington Mills, Great Barrington, Mass.	500,000
Kavanaugh Knitting Co., Waterford, N. Y.	500,000
Mohawk Valley Cap Co., Utica, N. Y.	500,000
Little Falls Mfg. Co., Little Falls, N. Y.	500,000
Avalon Knitting Co., Utica, N. Y.	500,000

	Gals. Per Day
National Silk Dyeing Co., Paterson, N. J.	16,000,000
Weidmann Silk Dyeing Co., Paterson, N. J.	10,500,000
J. H. & C. K. Eagle, Shamokin, Pa.	1,000,000
M. Heminway & Sons Silk Co., Watertown, Conn.	250,000
Merrill Silk Co., Hornell, N. Y.	300,000
Julius Kayser & Co., Amsterdam, N. Y.	200,000
American Woolen Co., Boston, Mass.	6,000,000
Stroock Felt Co., Newburgh, N. Y.	2,600,000
Scotia Worsted Mills, Woonsocket, R. I.	1,000,000
Hoosac Worsted Mills, North Adams, Mass.	1,000,000
Wauskanut Mills, Farnumsville, Mass.	1,000,000
Waterloo Woolen Mfg. Co., Waterloo, N. Y.	1,000,000
McCleary, Wallin & Crouse, Amsterdam, N. Y.	1,000,000
Holden-Leonard Co., Bennington, Vt.	500,000
Jos. Benn & Sons, Greystone, R. I.	1,000,000

HUNGERFORD & TERRY, Inc.

ENGINEERS AND MANUFACTURERS OF WATER FILTERS

PENNSYLVANIA BLDG., PHILADELPHIA, PA.

F. P. SHELDON, Pres. J. B. BARRETT, Agent H. EARLE KIMBALL, Treas.

Franklin Process Co.

290 Promenade St. *(5 minutes from Union Station)* Providence, R. I.

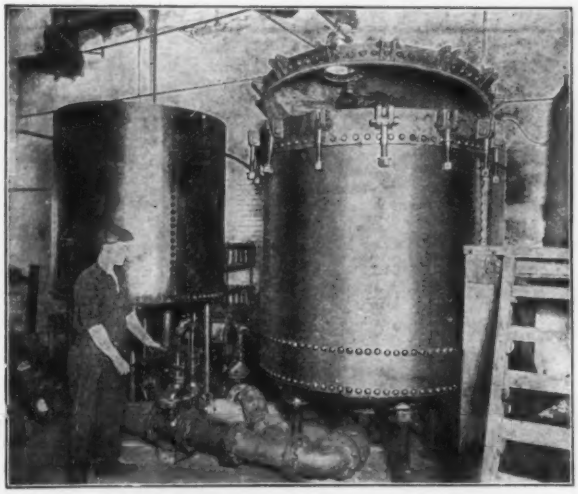
Yarn Dyeing and Dyeing Machinery

Job Dyeing

Most Direct Method of Dyeing Woolen and Worsted Yarns

Complete Dyeing Equipments Installed in Textile Mills

No Steam in the Dye House



Saves Time Waste Steam Labor Dyes and Therefore Money

All Acid Resisting Metal F. P. Co. Worsted Dyeing Machines

Machines Furnished With Capacity of 100 to 250 lbs. to a Batch

NO FELTING SHRINKING WASTE

Even Dyeing
Easy Matching
3 Batches a Day

The illustration here ☞ shows:

Finished Product—

Universal Wound Packages

FPCo

Anyone interested we shall be pleased to show through our job dyeing plant at above address

For Small Pulleys and High Speeds

"Gutta-Balata" Belting is made on very strong, extra heavy, cotton duck, the plies being firmly "bonded" together.

Has minimum amount of stretch—each belt is thoroughly stretched in the making.

Will transmit the maximum amount of power.

We will gladly give you further information regarding "GUTTA-BALATA" belting on request

Rubber Covered Rollers

For All Textile Uses

New Rollers Complete **Old Rollers Re-covered**

Our rubber coverings are of the very highest quality of stock, and can be supplied in any required consistency for any specified purpose.

Hose **Packings** **Valves**
Diaphragms **Gaskets**

BOSTON BELTING CO.

Home Office and Factories: Boston

New York **Buffalo** **Chicago** **San Francisco** **Portland, Ore.**

SMITH, DRUM & CO.

"BUILDERS OF THE BEST"

Labor Saving Machinery for Dyeing, Singeing and Finishing

HOSIERY

IN SULPHUR, ANILINE, DEVELOPED BLACKS AND COLORS
POWER SCREW PRESSES and MERCERIZING MACHINES

SAVE LABOR and DYE STUFF and do BETTER WORK
in your dye house by using

Smith, Drum & Co. Machines

Full Particulars on Application

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Cumberland Streets,
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Southern Agent
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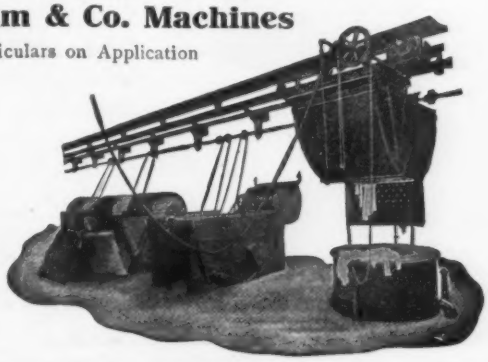
CHARLOTTE, N. C.



LAWSONS

Hope Foundry, LEEDS, England

BRANCH OF

Fairbairn Lawson Combe Barbour, Ltd.

MAKERS OF MACHINERY FOR

Preparing and Spinning

Flax, Hemp, Tow and Jute

Special Machinery
for the Manufacture of
Twines, Rope Yarns and Binder Twine

Good's Combined Hackling and Spreading Machine.

Long Reach Screw-Gill Drawing Frames. Chain-Gill Drawing Frames with Apron Heads.

Patent High-Speed Horizontal and Automatic Spinning Frames for Manila.

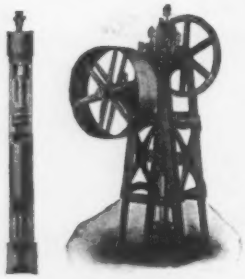
Improved Laying Machines.

Haskell-Dawes Tubing Twisters.

Brownell's Patent Twisting and Laying Machines for Twine.

N. B.—Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

For Deep Well Pumping Service



904 Cylinder and 1030 Working Head

Goulds Power Working Heads and Cylinders are made in all capacities for pumping water from deep wells.

They can be furnished with direct connected electric motors or with pulleys for belt drive as desired.

The complete line of Goulds Deep Well Power Pumps is shown in Bulletins No. 107 and 108.

WRITE FOR COPIES

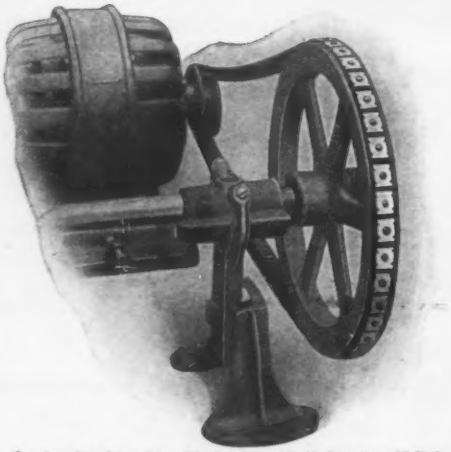
THE GOULDS MFG. CO.

LARGEST MFR. OF PUMPS FOR EVERY SERVICE

62 W. FALL STREET - SENECA FALLS, N. Y.

Branches and Agencies in Principal Cities

Peerless V Silent Chain Drives



Sewing Machine Line Shaft with 2 H. P. Peerless V Belt

Are absolutely noiseless in operation. Can be operated on very close centers. Are not in any way effected by moisture, dust, grit or lint. And owing to the principle of the wedge being fully utilized, slippage is avoided, making a positive drive.

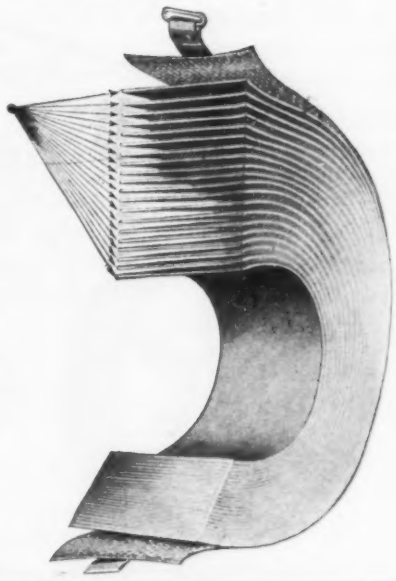
If you are bothered with transmission troubles send for full information and let us solve them for you.

PEERLESS V BELT CO.

NEW YORK CEDAR RAPIDS, IA. CHICAGO

Millions of Dead Air Cells in Every Layer

"Dead Air" (motionless air) is recognized by engineers all over the country as the most efficient non-conductor of heat. As every layer of J-M Asbesto-Sponge Felted Pipe Covering contains millions of minute "dead air" cells—more than any other covering—it must consequently be the most efficient pipe covering. Therefore it will save more in fuel bills and increase the efficiency of a plant more than any other covering.



J-M ASBESTO-SPONGE FELTED PIPE COVERING

in one test on 100 lineal feet of 2 inch pipe carrying steam at 150 lbs. pressure (plant working 300 days of 10 hours each, average temperature of room being 65 degrees Fahr.), an annual saving of 50c. per square foot of heated surface was effected.

This covering is made of many layers of thin felts, composed of pure Asbestos fibre and finely ground sponge. It is tough and flexible, so that vibration, moisture, heat or rough usage will not cause it to break, crack, crumble or lose its insulating efficiency. Can be taken off and replaced without injury indefinitely.

Write our nearest Branch for sample and Catalog No. 100.

H. W. JOHNS-MANVILLE CO.

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THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED 1734
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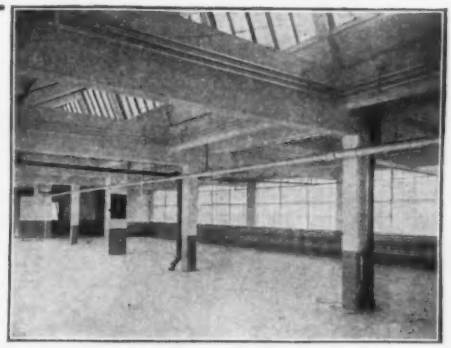
Bay State BRICK and CEMENT COATING

In Textile Mills

"LIGHTS LIKE THE SUN"

Many of the largest mills are using this great preparation in greater and greater quantities. It does not chip off when applied over delicate machinery, can be used in damp rooms because it stays where it's put, and is impervious to moisture.



LYON'S SHOE FACTORY, BOSTON, MASS.
DENSMORE & LE CLEAR, ENGINEERS

BAY STATE

Write us for the names of textile mills that have used this coating. Ask your dealer for it. If he cannot supply you write us. Drop a postal for Booklet K, that tells you all about Bay State Brick and Cement Coating.

Wadsworth, Howland & Co., Inc.

Paint and Varnish Makers and Lead Corroders

82-84 Washington St. - - Boston, Mass.

New York Office, 101 Park Avenue at 40th Street

Note that Groove

It Minimizes Power Waste by Minimizing Belt Slip

Belt slippage is often caused by air getting between the belt and the pulley face. This "air pocket" lifts the belt, lessens the gripping surface, and weakens the belt grip.

"American" STEEL SPLIT Pulleys

Perfect in Principle Powerful in Performance

PATENTED

are constructed with a grooved "air escape." This not only improves belt contact, but strengthens the pulley by providing a turned-in flange, to which are riveted the spider arms.

"American" Pulleys are light, strong, practically indestructible, and guaranteed for double belt service under any conditions not requiring a special pulley.

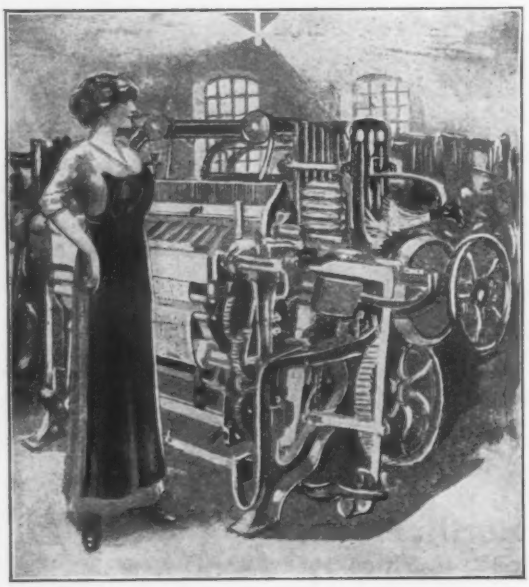
WRITE FOR "FACTORS OF ENERGY" — A LITTLE USEFUL BOOK.

The American Pulley Company

Office and works, Philadelphia, Pa.

Warehouses: New York, Cor. Grand and Greene Streets; Boston, 165 Pearl Street; Chicago, 124 So. Clinton Street.

DEALERS EVERYWHERE



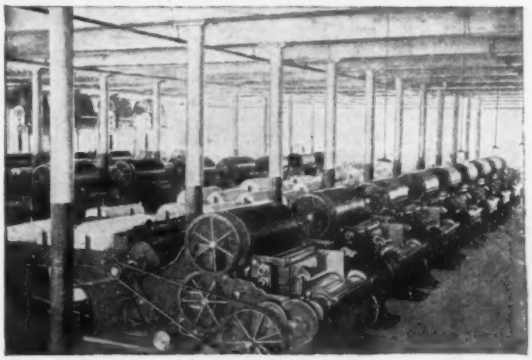
She is Happy

because the International Moistening Company's Humidifiers are producing the required amount of moisture to keep the work running well, and sufficient fresh air to make her comfortable.

This Means Production

THE INTERNATIONAL MOISTENING CO.

Jackson Bldg., Providence, R. I.



Before Westinghouse Individual Picker Motors were installed in this Picker Room, the air was dusty, artificial lights were often required even during the day; belt upkeep and power lost in shafting was a big expense.

The cut shows the room after the Westinghouse Picker motors were installed—reduced power cost, smaller light bills, operation more efficient.

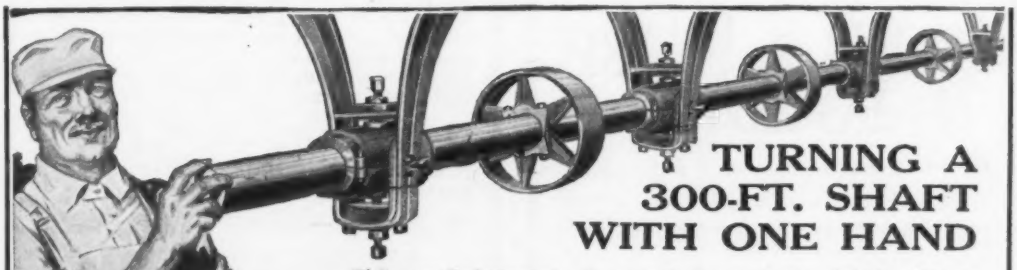
The picture shows some of the reasons why efficiency is increased and economies are procured by the use of

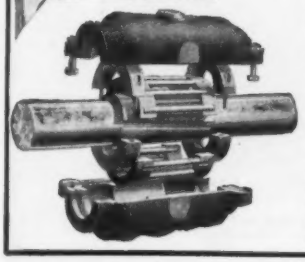
Westinghouse Individual Picker Motors

There are other reasons that possibly you never thought of. Send for "Textile Quarterly 5."

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Boston: Safe Deposit & Trust Building **Charlotte: American Building**





TURNING A 300-FT. SHAFT WITH ONE HAND

This actually happened. In a certain factory in New Britain, Conn., a 3 15-16″ shaft, 300′ long, weighing 3 tons, with pulleys and couplings, was equipped with SELLS Roller Bearings. ONE man was able to turn this shafting over with ONE hand. This speaks much for

SELLS Roller Bearings.

This was a rather big fellow, and a little man in the shop "from Missouri", declared that it would be impossible for a small man, for instance, a man of HIS size, to perform the same feat, so HE (the little fellow) was given an opportunity to try it.

His stubby fingers would hardly grip the shaft, but—he MANAGED TO DUPLICATE the feat of the larger man, to his own satisfaction.

Write us for the "Fifteen ads our customers wrote."

Royersford Foundry and Machine Co.

56 N. Fifth Street : : : : : : PHILADELPHIA

Power Transmission Machinery, Punching and Shearing Machines, Emery Grinders

"Rollerine" is the Name of a High grade Lubricant We Sell.

GENTLEMEN: Send me the fifteen ads your customers wrote.

Name..... Address.....

T.W.R. 10 13

Are You Posted On This Machine?

Have you written yet for your copy of the Hydro-Extractor Book which tells all about Schaum & Uhlinger Hydro-Extractors and give a big list of users?

You *should* be posted on the

Schaum & Uhlinger Hydro-Extractor

for this is the machine that stands head-and-shoulders above the crowd of centrifugal separators. as investigation will prove to you.

The machine shown above is the direct-connection electric-drive that is so popular with textile manufacturers. You can set this machine wherever there is room for the tub—no need to consider shafting or steam lines.

It is strong, compact and will last for years without repairs.

Send a postcard for the free book on Hydro-Extractors. No obligation.

Schaum & Uhlinger, Inc.
204 Glenwood Avenue
Philadelphia, U. S. A.

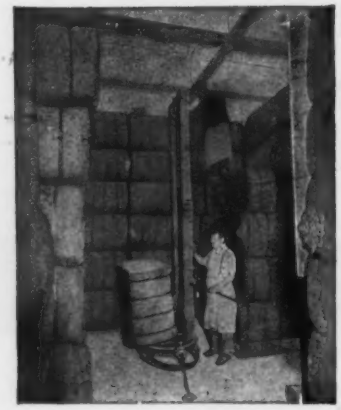


Figure 1. Placing bale on Revolvator at end of aisles.

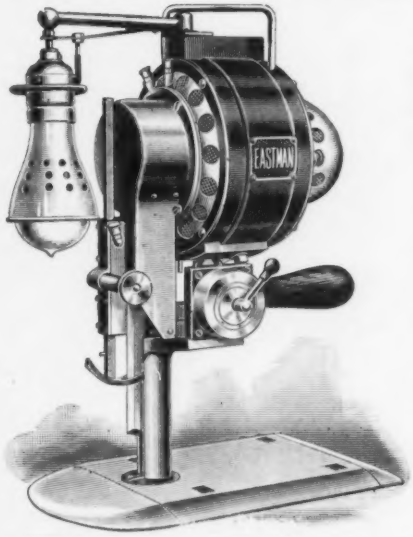
Tier at End of Aisles

FIGURE 1 shows how you can put a case, bale or barrel on a **Revolvator** platform when it is pointing down an aisle, then (Figure 2) by swinging it around the load can be pushed off at the side or rear. For tiering at the end of narrow aisles, what good is a tiering machine that cannot be turned around? ¶Don't forget that the **Revolvator** turns on its own center on ball bearings, but is provided with a catch which automatically locks it in any position, so that it positively will not swirl around when in use. ¶If you want to find out how to increase the capacity of your storehouse and to stow twice as many cases per day, write for our booklet W18, "*Scientific Tiering*."

N. Y. Revolving Portable Elevator Co.
349 Garfield Ave., Jersey City, N. J.
25A

Figure 2. Revolvator swung around for unloading.

There Is No Excuse For Not Installing



—AN—

Eastman Cutting Machine

A type for every class of material; a type for every kind of current. No matter what your factory conditions, an Eastman will start you on the road to larger profits.

(*Free trial for all styles*)

ROUND KNIVES ALTERNATING CURRENT
STRAIGHT KNIVES DIRECT CURRENT

The Eastman Machine Co.

Washington & Goodell Streets, BUFFALO, N. Y.

NEW YORK 186 Lafayette Street | CHICAGO 815 W. Van Buren Street | PHILADELPHIA 110 N. Sixth Street | BALTIMORE 110 W. Fayette Street | DETROIT 73 State Street
SAN FRANCISCO, Cal., 682 Mission St. | KNOXVILLE, Tenn., 10 Central Market | BOSTON, 564 Washington St.

A REPORT ON

SIZOL TRADE-MARK

To Users of SIZOL we give the following for basis of comparison with their own results.

"We find after a series of thirteen tests covering a period of four days, that the sized yarn on the first of the kettle gains 10.29% over the raw yarn in breaking strength and 7.67% in weight, and on the last of the kettle it gains 14.23% in strength and 8.10% in weight. Thus making a gain in the last of the kettle over the first of 38.2% in strength and 5.6% in weight."—*A Southern Mill.*

Do You Boil Your Size Long Enough?

AT YOUR SERVICE

THE SEYDEL MFG. COMPANY, 86-100 Forrest St., Jersey City, N. J.

When dirty oil drips on fabrics

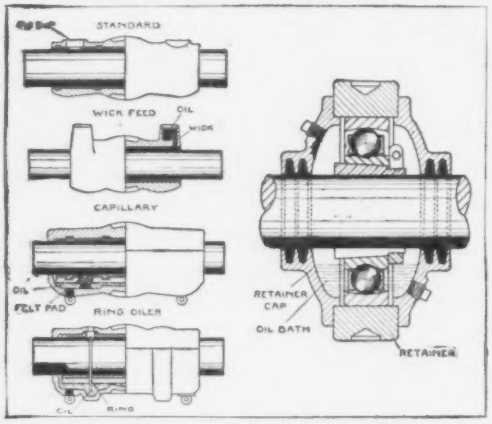


Fig. 2.—Comparing Shaft Journals to Show Perfect Lubrication and Oil Retention of Ball Bearing Box

NEW DEPARTURE

Frictionless

Ball Bearing Shaft Hangers

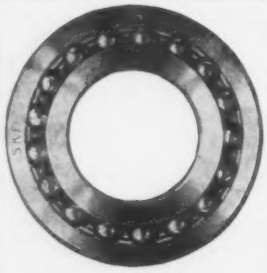
Retain oil, exclude dust and do not need large quantities of oil

Study these drawings carefully. The best of plain bearing boxes are shown. Do you see anything to prevent leakage of lubricant through the ends of the boxes? The rotation of the shaft helps to carry the oil out and this wasted lubricant drips from the ends of the hangers. Even when drip pans are provided they frequently overflow or work loose from their fastenings.

New Departure ball bearing shaft hangers are equipped with a box that is an oil retaining structure. The bearing revolves in a housing, only partially filled with lubricant. The shaft needs no lubrication. The balls are always oiled. The bearing housing closures have packing grooves that keep the oil from working out on the shaft.

This is only one advantage New Departure Ball Bearing Shaft Hangers offers particularly to the textile manufacturers. *This hanger will absolutely increase the efficiency of your power transmission system by reducing the friction load over fifty per cent.*

The New Departure Mfg. Co. Factory Equipment Dept. **Hartford, Conn.**

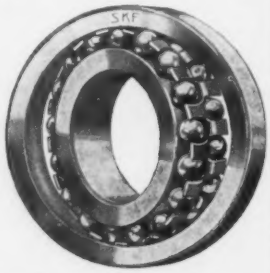


How Much Power Do Your Spinning Frames Waste?

You can save at least 20% of the power required to drive your spinning frames, and know that while doing this you are increasing the efficiency of not only your machines, but of your entire mill. In several types of spinning frames, the employment of

S K F
Self-Aligning Ball Bearings

ON THE DRIVING CYLINDER ALONE has increased the efficiency of these machines between 5 and 7%; the machine carrying 140 spindles at a speed approximately 10% above that attained by machines using plain bearings. When S K F Self-Aligning Ball Bearings were applied to the spindles as well as to the cylinder bearings, a power saving of over 25% has been made. This has been cited to emphasize the savings which may be effected on machines running on the shop floor. The use of S K F Self-Aligning Ball Bearings has proven that a similar economy may be effected on many other types of textile equipments.



S K F Self-Aligning Ball Bearings

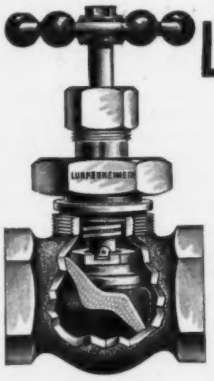
Give the greatest efficiency, the smoothest operation, the fewest repair troubles, the lowest operating and maintaining cost, the longest life and require the least lubrication and attention.

WHY? Because they are SELF-ALIGNING and run frictionless. There are many other good reasons which you should know.

Write for Bulletin No. 9

SKF BALL BEARING CO.

50 Church Street, New York — 608 So. Dearborn Street, Chicago



LUNKENHEIMER REGRINDING VALVES

have invariably *maintained a reputation for quality* of the very highest. They are made by *skilled mechanics*, and the *best grade of only new material* is used.

Should the seating faces become worn, they *can be reground*, making them as tight as when new, and this process can be repeated quite a number of times.

All parts are renewable, making the *valves practically indestructible;* the stuffing-boxes can be repacked under pressure when the valves are wide open, and the passages through the bodies are free and unobstructed.

Lunkenheimer Regrinding Valves are made in two patterns: *Medium*, for working pressures up to 200 pounds and *Extra Heavy*, for pressures up to 300 pounds per square inch,—sizes ranging from ⅛ to 4 inches inclusive.

Specify and insist upon securing genuine *Lunkenheimer make.* Do not accept substitutes,—they are never as good as the genuine.

"MOST supply houses sell them—yours CAN—if they DONT or WONT—tell US"

Write for catalogue

THE LUNKENHEIMER COMPANY

Largest Manufacturers of High Grade Engineering Specialties in the World

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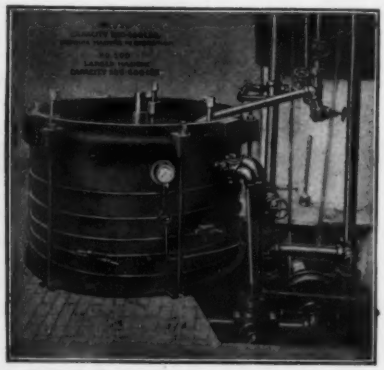

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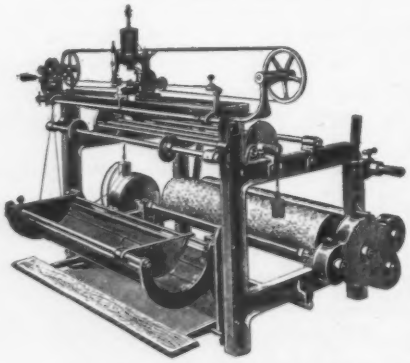

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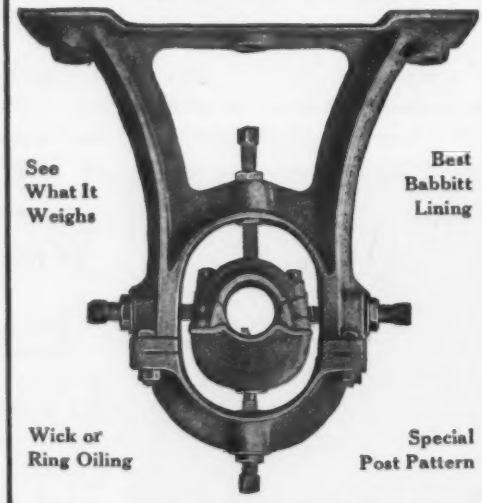

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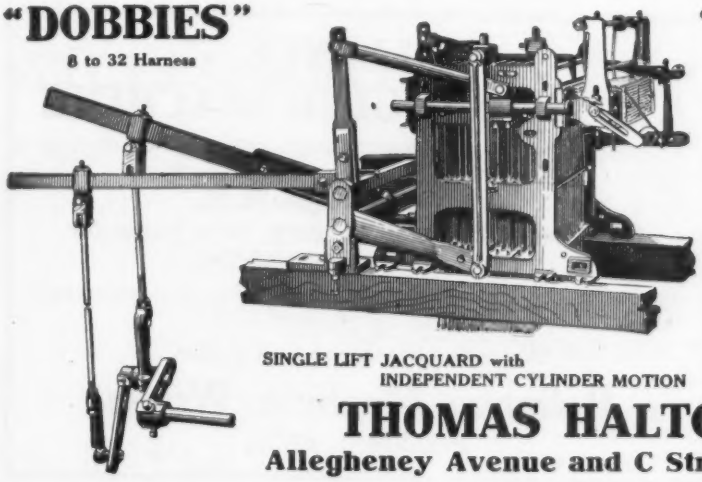

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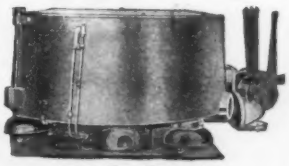

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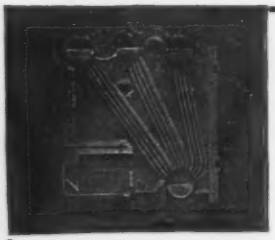

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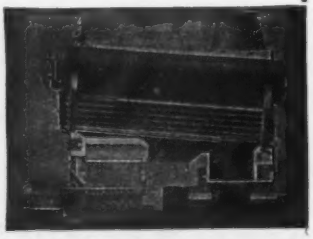

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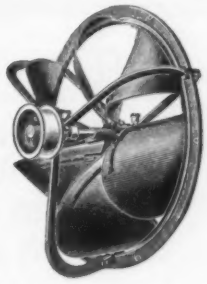

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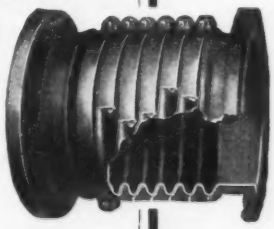

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TEXTILE WORLD RECORD

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BOSTON, MASS.

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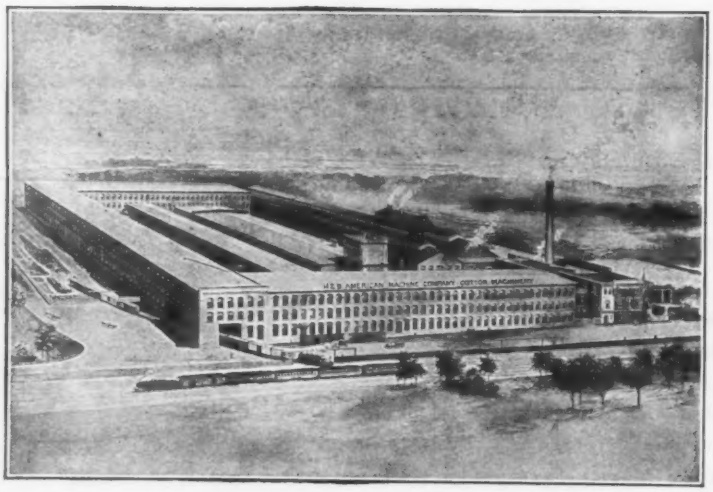
Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

COTTON MACHINERY



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TEXTILE WORLD RECORD

Number 1 OCTOBER, 1913 Volume XLVI

Monthly Comment.

Moisture in Wool at Boston and Bradford

The passage of the Underwood bill placing wool on the free list and providing for competitive rates on partly manufactured and finished goods, brings home to the woolen and worsted trades, and particularly to dealers in worsted tops and yarn, the question of moisture in wool materials in this country and abroad. The tariff on tops and yarn is probably fixed for four years at least, and whether it provides adequate protection or not, the business of making and selling tops and yarn will have to be conducted in this country under the new rates until the law is changed. That being the case it is of importance to American manufacturers and merchants that, apart from the tariff, they conduct their business on even terms with their foreign competitors.

An important factor in such competition is the amount of moisture absorbed by tops and yarn. At Bradford, the center from which the greatest competition is to be expected, it is the practice to sell tops and yarn on a conditioned basis, following being the recognized standards of regain:

Tops combed, with oil	19%
Tops combed, without oil	18¼
Noils, ordinary	14
Noils, scoured or carbonized	16
Worsted yarn	18¼
Wool Waste	16
Worsted and Woolen Cloths	16

If sales are made in this country on a conditioned basis with the same allowances for moisture, the conditions, of competition will be equal so far as the quantity of material delivered is concerned. Unfortunately, however, part of the trade in tops in this country has accepted a 15 per cent. as a standard for moisture, while the remainder of the tops trade and practically all of the yarn trade are carried on without any established standard of regain. It is important for top-makers, spinners, weavers and dealers in textiles to understand what it means to them to buy and sell by the different standards or without any standard. A top-maker who sells his product on the basis of 15 per cent. regain is at a serious disadvantage in competition with English tops on a 19 per cent. basis at the same price for the same quality.

Take for illustration, say 11,900 pounds of super 60s tops from Bradford sold on a basis of 19 per cent. at 56 cents a pound, and amounting to $6,664. The American top-maker who sold the same quantity on a 15 per cent. basis would invoice only 11,500 pounds, which at the same price, 56 cents, would amount to only $6,440, the difference amounting to $224 or 1.95 cents per pound. In other words it would be necessary for the American top-maker to charge 57.95 cents per pound in order to make the price equivalent to 56 cents a pound for the English tops.

On the other hand, if the spinner buys English tops with an allowance of 19 per

cent. at the same price that American tops would cost him he is the loser by a corresponding amount. Take for example 11,500 pounds of American tops offered at 56 cents, amounting to $6,440. If the spinner buys 11,500 pounds of the same quality of English tops at the same price on a 19 per cent. allowance, he will pay the same amount, $6,440, for the lot, but he will actually receive only 11,113 pounds on a 15 per cent. basis, or 387 pounds less than he would have received if he had purchased the American tops, the difference amounting to $216 72, or 1 7/8 cents per pound. These illustrations could be multiplied indefinitely, all showing the confusion and loss on gain that results from dealing with a double standard for moisture in textile materials.

In the case of worsted yarn the trade will have to contend with a standard allowance of 18 1/4 per cent. on foreign yarn and no established standard for American yarn. The remedy of course is to establish a standard regain for worsted in the United States. The illustrations we have given in the case of tops show how desirable it is to have the same standard here and abroad. While it is also desirable that the allowance for moisture should be as near the actual regain as possible, a variation makes no real difference so long as both buyer and seller understand the basis on which they are dealing.

In order to shed some light on the actual regain for worsted in this country and abroad, we had our English representative obtain a copy of the daily record of temperature and humidity at Lester Park, Bradford, for the year 1912, and we also obtained a corresponding record of daily observations at the U. S. weather bureau in the tower of the post office building at Boston for the same year. We then obtained from W. D. Hartshorne's well known tables of worsted regain, the percentage of regain for each daily record at Bradford and Boston. The table which follows gives the highest, lowest and average regain for each month and for the year at each locality. As the Hartshorne tables do not give the percentage of moisture for temperatures below 35° F., the regain could not be determined for the few days at Bradford and the somewhat greater number of days at Boston, on which the mercury dropped below 35°. It is not believed, however, that the results would be appreciably changed if the regain for these days had been available. Following is the summary of the observations:

Highest, Lowest and Average Regain for Worsted at Boston and Bradford for each month of 1912.

Boston

	Low	High	Av.
January	21.8	24.9	23.7
February	15.4	24.9	20.1
March	13.1	28.2	20.2
April	12.4	28.2	20.6
May	11.0	27.5	18.3
June	12.1	22.7	15.6
July	12.2	22.8	17.3
August	14.6	24.2	18.3
September	15.6	23.7	19.5
October	12.6	26.7	18.9
November	14.1	25.3	19.4
December	15.5	28.2	21.2
12 months	11.0	28.2	19.4

Bradford

	Low	High	Av.
January	20.4	28.2	24.7
February	20.0	27.1	24.4
March	21.1	26.7	23.5
April	15.2	26.7	22.3
May	15.5	27.1	22.9
June	16.6	27.1	21.8
July	16.5	26.3	22.1
August	17.8	27.1	21.9
September	18.8	25.2	22.2
October	19.2	28.2	23.5
November	19.6	26.0	22.9
December	20.4	27.0	23.6
12 months	15.2	28.2	22.9

It appears from this record that the average regain for worsted during 1912 was 19.4 per cent. at Boston and 22.9 per cent. at Bradford. On this basis the foreign standard of 18 1/4 per cent. is only 1.15 per cent. below the actual regain at Boston, and 4.65 per cent. below the actual at Bradford. This does not afford any basis for complaint against the foreign standard on the part of the American trade, and points to the conclusion that the 18 1/4 per cent. allowance should be adopted for worsted in the United States. In this way the American trade would obtain a standard very close to the

actual regain in New England and having the great advantage of uniformity with the standard that is recognized generally in foreign countries.

A Standard Wage List

The question of a standard wage list for cotton mills was recently brought to the attention of the textile trade by a statement issued by the New Bedford Weavers' Union, from which we take the following extract:

> Weavers at all times are looking forward to the day when they can figure their pay by a standard list of prices. The manufacturers are too fond of changing the different style numbers, when a new warp is placed into a loom, and drop the price per cut.
>
> One mill in this city pays $2 per cut for a certain style; another manufacturer pays $1.76 per cut for the same class of goods. If it is advisable for the commission on the tariff question to come to the point of computing their work on the number of threads per inch, why should not the weavers be allowed to figure their pay on the same basis? It would stop a lot of competition among the manufacturers on the selling prices, and the weavers would receive better wages.
>
> Some of the weavers in the city think that manufacturing silks in a cotton mill is out of place, and are dissatisfied at prices per cut they are to be woven at, and know that better prices could be obtained at a silk mill, and less looms to operate, than in our cotton mills. The officials of the Weavers' Union of this city expect that when the State Board on Labor and Industries gets down to business it will see that certain laws are enforced.

The establishment of a standard wage list for cotton mills in the United States is likely to prove a long and difficult task. The great distances separating the various mill districts, the racial differences, the variation in the standard or the cost of living, and the divergence in classes of goods made and methods of doing business create obstacles to a standard list that may prove insuperable in this country. Even in England where a fairly homogeneous working population and an unparalleled concentration of the cotton industry made the task comparatively easy, it has taken over a hundred years to give the cotton trade a standard list that still falls far short of complete uniformity.

Doubtless the evolution of a standard wage list in the United States will begin with separate industrial centers, such as New Bedford, Fall River, and the Charlotte district. The proposition advanced by the New Bedford Weavers' Union is in line with such a development. The ultimate object to be obtained will be worth to both employers and employes all the time and trouble that it will cost. The English standard wage list is an essential part of the cotton industry of Lancashire. How highly it is prized was illustrated in Parliament several

THE LITTLE RED BOOK WHOSE DESTRUCTION WAS MR. SHACKLETON'S STRONGEST OBJECTION TO A CHANGE OF BRITISH WEIGHTS AND MEASURES

years ago when the bill to make the use of metric system of weights and measures compulsory was under discussion. After the confusion and financial losses that would result from the enforcement of such a law had been described in many earnest speeches, Mr. Shackleton, the member from Clitheroe, Lancashire, arose to protest against the bill. In order to give the House of Commons the most convincing proof possible of the overwhelming disaster that would follow the enactment of the metric law, he drew from his pocket a little red book, and holding it up before his audience, he shouted:

> This little red book has cost thousands of pounds and has taken fifty years in the bringing of it to its present state. If this bill were to be put into operation it would not be worth the paper on which it was printed.

The little red book was the standard wage list of the English cotton industry.

During the year ending January 5, 1813, 35,336 pounds of wool were imported into England from the United States.

The ordinary cotton fiber under the microscope reveals itself as an irregular, flat, but twisted ribbon.

The Philippine Cotton Trade

An inquisitive member of Parliament from Lancashire recently asked the representative of the Board of Trade whether the preference given to Philippine imports from the United States was proving injurious to British exporters. He was told in reply that the preference went into effect in 1909, and that since that time the Philippine imports from the United Kingdom had shown some tendency to decline. This tendency in the cotton trade is made plain by the following comparison of the imports of cotton goods in the Philippines for the years 1904, 1911 and 1912:

	1904	1911	1912
United States	$319,754	$3,846,337	$5,996,488
United Kingdom	2,209,344	2,856,221	2,440,404
Japan	190,773	1,003,429	1,112,686
Germany	276,597	391,094	429,717
Spain	759,171	371,071	388,464
Switzerland	357,516	307,588	324,836
China	....	89,348	67,714
Italy	....	69,789	62,354
East Indies	356,536	63,770	54,058
France	89,256	43,075	63,198
Belgium	....	42,142	33,967
Austria-Hungary	....	20,959	24,681
Netherlands	....	15,704	20,032
All other countries	345,257	3,576	13,373
	$4,904,204	$9,124,103	$11,032,072

The changes in the relative position of the respective countries is shown by the following table which gives the percentage of the total cotton goods imports for each country for the years 1904 and 1912:

	1904	1912
United States	6.5%	54.4%
United Kingdom	45	22.2
Japan	3.9	10.1
Germany	5.6	3.9
Spain	15.5	3.5
Switzerland	7.3	2.9
China	..	.6
Italy	..	.6
East Indies	7.3	.5
France	1.8	.6
Belgium	..	.3
Austria-Hungary	..	.2
Netherlands	..	.2
All other countries	7.1	..
	100%	100%

The share of the United States in this trade was 6 1/2 per cent. in 1904, and eight years later under the preferential arrangement it is 54 1/2 per cent. During the same period the British proportion dropped from 45 per cent. to 22 1/2 per cent.

Japan is the only country besides the United States showing an increase, Japanese goods accounting for 3.9 per cent. of the total in 1904 and 10.1 per cent. in 1912. In connection with the fact that in 1904 Japan and the United States were competing on even terms while in 1912 American cotton goods were admitted free and Japanese goods were subject to a duty of approximately 25 per cent., this increase is a remarkable example of the power of Asiatic competition.

The following table gives the value of each class of cotton goods imported into the Philippines from the United States and from other countries in 1912:

	United States	All other countries
Unbleached cloths	$546,293	$59,256
Bleached cloths	1,736,693	934,137
Dyed cloths	1,068,351	1,094,604
Printed cloths	1,545,777	352,936
Blankets	54,408	30,949
Stockings and socks	48,698	105,910
Undershirts and drawers	101,477	712,653
All other knit goods	4,963	4,253
Coats, trousers, vests	59,122	1,085
Collars, cuffs, shirts	104,801	27,463
Clothing and other apparel	15,082	9,403
Waterproof garments	13,605	10,675
All other clothing	50,426	42,413
Embroideries	195	112,257
Gum elastic fabrics	28,445	14,643
Handkerchiefs	32,903	193,066
Lamp wicks	2,348	6,001
Piques	8,130	37,398
Plushes, velvets, etc.	420	17,679
Shoe and corset laces	11,370	2,190
Towels	16,682	62,681
Trimmings, ribbons, etc.	4,458	94,904
Laces	1,999	97,381
Tulles	545	15,755
Cotton waste	20,442	16,411
Thread	393,405	90,292
Unbleached yarn	155	122,981
Bleached yarn	920	286,269
Dyed or colored yarn	2,888	288,694
Mercerized yarn	309	148,376
Counterpanes	239	10,039
All other manufactures of cotton	120,933	32,830
	$5,996,488	$5,035,584

With the exception of tulles and laces, cotton waste and yarn, the Philippine tariff on the various classes of cotton goods is fairly uniform. The goods above named are separated in the following table which shows

the value of dutiable imported into the Philippines for the year ending June 30, 1913, also the amount of the duties collected on the average ad valorem rate. The duties on goods subject to specially low or high rates are given separately:

Tulles and Laces	$104,367	$58,732	56.2%
Cotton Waste	13,355	1,337	10
Yarn not mercerized thread	735,931	116,457	15.8
Yarn, mercerized	113,532	29,644	26.1
All others	3,691,614	956,784	25.9
	$4,658,799	$1,162,954	24.9

The Average Yarn Number for the Underwood Cotton Cloth Tariff.

The letter which follows comes from a cotton goods merchant and calls for information that should be in the possession of every cotton manufacturer and merchant:

New York, Sept. 22, 1913.

Editor Textile World Record:

In your issue of September, 1913, you point out that your magazine originated the idea of basing the tariff on cotton cloth on the average number of the yarn. It seems to me that would be the fairest way if the average could be accurately determined. In cloth made with a plain weave where width, count and weight are known, it is a simple matter, but where several different sizes of yarns are used in varying proportions, the calculation would be complex.

I do not suppose you would have made the suggestion unless this calculation was practicable, for it goes without saying the merchant should be able to calculate his own goods. It seems to me it would not be right to suggest that a tariff should be based upon any factor which is so difficult to arrive at that it can be determined only by experts, or after a tedious and difficult course of training.

Possibly the calculation you have suggested can be easily made. My purpose in writing is to ask for a formula which can be readily understood by the average handler of textiles, and which will accurately determine for tariff purposes the average size of the yarn in a fabric having more than two sizes of yarns. Gera.

The number of cotton yarn, as the term is commonly used, indicates the number of 840-yard lengths in a pound of yarn. Thus a pound of 10s yarn measures ten times 840 yards or 8,400 yards; 20s yarn, 16,800 yards; 30s yarn, 25,200 yards, etc. Cotton yarn has been numbered by the 840-yard system from time immemorial, and this method is now a standard for cotton manufacturing in all parts of the world.

ORIGIN OF THE TARIFF YARN NUMBER

Yarn, when measured to determine the number, is drawn so as to prevent any slackness, but without tension that might increase the length. Tariffs on cotton yarn have long been adjusted to the yarn number. The Payne tariff, for example, provided for a duty of 2 1/2 cents per pound on all numbers up to and including 15s, and one-sixth of a cent per number per pound on all numbers from 15s to 30s. A tariff on yarn adjusted to the number of the yarn presents no difficulty in administration, for the number of the yarn can easily be determined by measuring and weighing a sample, as has been done for many years.

Two years ago when the Democratic Ways and Means Committee reached the cotton tariff in their schedule by schedule program of revision, they found no difficulty in the yarn paragraph, because the yarn number afforded an excellent basis for the adjustment of rates. A most difficult problem, however, was presented by the complicated Payne classifications of cotton cloths, based on threads per inch, square yards per pound and value. After wrestling with this problem for some time it was suggested that the cloth rates be based on the number of the yarn in the cloth. The ease with which the yarn paragraph had been disposed of made this a natural suggestion for the cloth tariff. We are informed by those who took part in conferences with the committee at that time, that Chairman Underwood was as much responsible as any one for applying the idea to the cloth paragraph. On July 18, 1911, the Chairman obtained an opinion from the Bureau of Standards to the effect that the number of the yarn in cotton cloth could be easily and accurately determined. Thus fortified he wrote the cotton cloth paragraph of the Underwood cotton bill of 1911, basing the rates on the number of the yarn. Nevertheless, in the form in which it appeared in that bill, the scheme was utterly impracticable.

DEVELOPMENT OF THE NEW BASIS

It is impossible to determine from a sample of cloth with the accuracy required for tariff purposes, the changes in length and weight of the yarn that have occurred in the processes of weaving, dyeing, bleaching, mercerizing and finishing. It is in no way to the discredit of Mr. Underwood that he did not realize the impracticability of a plan so deeply involved in the technical intricacies of cotton manufacturing. His is the distinction of having adopted in three successive tariff bills an impracticable scheme which has since been developed into a simple and practicable method of adjusting tariff rates on cotton cloths.

Last March when it was certain that the new Congress would revise the tariff and before the Underwood bill was reported from the Ways and Means Committee, we pointed out the impracticability of the Underwood plan of 1911, and suggested changes that would perfect the method of adjusting the cloth rates to the yarn number. These suggestions, made in our March and April issues, included the following:

1. The adoption of the average yarn number as the basis for the adjustment.

2. Determine the yarn number by taking the length of the yarn to be equal to the distance covered by it on the cloth.

3. Take the weight of the yarn as found in the finished fabric after the sizing material has been removed.

The House under the leadership of Mr. Underwood failed to adopt these recommendations, but instead passed the tariff bill last April with the cotton schedule in the impracticable form originally adopted in 1911. While the bill was under discussion in the Senate the necessity for changing the cloth schedule was made so plain as to leave no other course for the Finance Committee than to adopt all three of our recommendations, the second one appearing in the bill in practically the same language used by us in March.

A NEW MEANING TO THE EXPRESSION

These changes give a new meaning to the expression "yarn number," and as they are now incorporated in the tariff law of the country, it will be necessary to distinguish clearly between the "number" of cotton yarn as the term is used in the cotton trade of all countries, and the "number" of cotton yarn as defined by paragraph 258 of the Underwood bill. The ordinary meaning is that the yarn number indicates the length of a pound of yarn. The tariff meaning is that the yarn number indicates the assumed length of yarn in a pound of cloth. For example, Figs. 1, 2 and 3 are sections of three weaves, plain, twill and satin, showing how the filling interlaces the warp. In the ordinary meaning of the term the number of the filling yarn in these samples is based on the length of the yarn after it has been drawn out to its full length, but for tariff purposes the law provides that the length of the yarn shall be assumed to be the distance covered by it in or on the cloth, that is, between the distance (ab), in Figs. 1, 2 and 3 respectively.

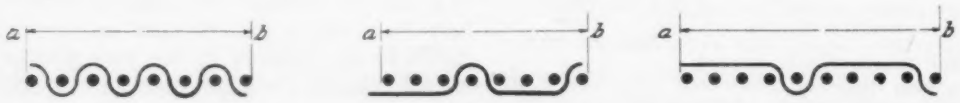


Fig. 1 Fig. 2 Fig. 3

Cross sections of plain, twill and satin weaves. The tariff yarn number is based on the assumed length (ab) of the yarn, without allowance for take-up.

The effect of this new meaning of the term "number of yarn" is to base the Underwood cloth rates on the threads per inch and square yards of cloth per pound, on which the Wilson, Dingley and Payne rates on cotton cloth were based. The only difference between the old method and the new is that the old method was complicated, irregular and unsystematic, while the Underwood schedule gives a direct and systematic adjustment of the rate to the threads per inch and square yards per pound.

TARIFF YARN NUMBER, THREADS AND SQUARE YARDS PER POUND

The tariff number of the yarn in a fabric indicates the number of 840-yard lengths of yarn in a pound of the cloth. Take for illustration, a cloth having 140 threads (80 of warp and 60 of filling) per square inch, and measuring 5 square yards per pound. The tariff length in yards of the yarn in a square yard of this cloth is found by multiplying the threads per inch (140) by the width in inches (36), giving a total of 5,040 yards of yarn. In 5 yards or a pound of the cloth there is 5 times 5,040 yards, or 25,200 yards of yarn, making the tariff number of the yarn 30s.

This calculation of the tariff number or length of the yarn in a pound of cotton cloth can be stated as follows: ("per inch" and "per pound" being understood).

(36 × threads × sq. yds.) ÷ 840 = tariff yarn number.

(Threads × sq. yds.) ÷ 23 1/3 = tariff yarn number.

Threads × sq. yds. = 23 1/3 × tariff yarn number.

Thus to find the tariff yarn number, that is the average yarn number as defined by the Underwood law, all that is necessary is to multiply the warp and filling threads per inch by the square yards per pound, and divide the product by 23 1-3. This rule applies to plain and fancy cotton fabrics, regardless of how many different sizes of yarn they contain.

It follows that the tariff number of the yarn varies proportionately with the product of the threads per inch and square yards per pound. And thus from the wholly impracticable plan proposed in the Underwood cotton bill of 1911 there has been developed this practicable and easily understood method of adjusting the ad valorem rates on cotton cloth to the product of the threads per inch and square yards per pound. This uniform relation between the tariff yarn number and the product of threads per inch and square yards per pound makes it possible to substitute this product for the tariff yarn number without affecting the tariff rates. For example, the Underwood rate on unbleached cotton cloth in which the average number of the yarn exceeds 39s and not exceeding 49 is 17 1/2 per cent. ad valorem. This range of tariff yarn numbers includes all cloths in which the product of the threads per inch and square yards per pound exceeds 910 (39 × 23 1/3) and not exceeding 1,143 1/3 (49 × 23 1/3). This convertibility of tariff yarn numbers and products is illustrated by the following table, which gives the rates on unbleached cloths of different yarn numbers, and the corresponding product of threads per inch and square yards per pound:

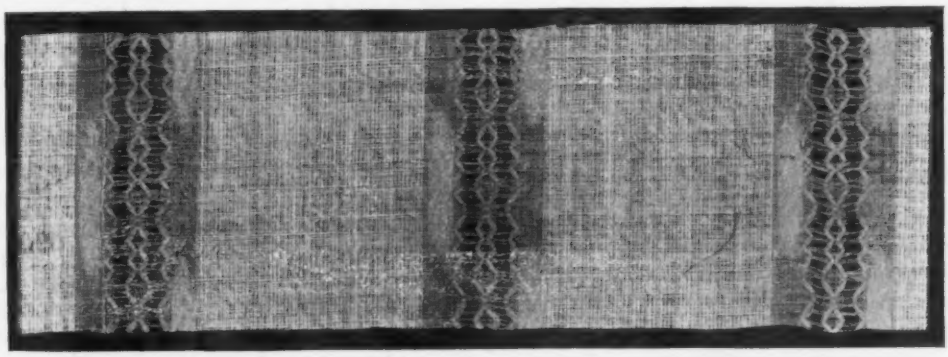


Fig. 4. A fancy cotton cloth, on which the Underwood duty is based on the average yarn number.

Yarn No.	Threads x sq. yds.	Duty
1 to 9	23⅓ to 210	7½%
9 to 19	210 to 443⅓	10
19 to 39	443⅓ to 910	12½
39 to 49	910 to 1,143⅓	17½
49 to 59	1,143⅓ to 1,376⅔	20
59 to 79	1,376⅔ to 1,843⅓	22½
79 to 99	1,843⅓ to 2,310	25
Over 99	Over 2,310	27½

Such is the simple system of tariff rates

on all woven fabrics of cotton, whether figured, fancy or plain, which has been developed by the changes in the Underwood plan of 1911. The calculations are as easy as with the Payne tariff, while the complicated classifications of the old method are avoided.

AVERAGE YARN NUMBER OF FANCY CLOTHS

The application of the new system to fancy weaves, such as the one shown at Fig. 4, and for which another correspondent asks us to calculate the tariff number, presents no difficulty. This cloth is 28 1/2 inches wide, made with a fancy leno weave. We analyzed the fabric and the following calculations illustrate the method of determining the tariff yarn number:

A sample 8 inches long, comprising two complete filling patterns and the full width, 28 1/2 inches, of the piece, giving an area of 228 square inches, weighed 150.5 grains, the weight of a square yard (1,296 sq. in.) being 855.5 grains, which is equivalent to 8.18 square yards per pound.

The warp threads in the full width of 28 1/2 inches were as follows:

192 ends 2-ply	singles	384
288 ends 2-ply, clipped		576
Single threads		1,945
Total		2,905

This is equivalent to (2,905 ÷ 28 1/2) 102 single warp threads per inch.

The cloth had 68 single threads per inch in the filling, making a total of 170 warp and filling threads per inch.

The tariff yarn number is now found as follows:

(170 × 8.18) ÷ 23 1/3 = 59.6 tariff yarn number.

This particular pattern was woven with part of the warp threads floating on the back. When the cloth was sheared the floating parts of the warp were cut off. It is plainly impossible to measure the distance on the cloth actually covered by the clipped threads. The conference committee readily recognized this fact and inserted the following provision to cover this class of fabrics: "All clipped threads shall be measured as if continuous."

This calculation for Fig. 4 shows that the determination of the tariff yarn number presents no special difficulty, the operations being practically the same as were necessary for finding the threads per inch and square yards per pound under the Payne cotton schedule.

THE "STRAIGHT LINE" CALCULATION

It is also evident that the tariff yarn count can be found by the "straight line" calculation, explained in our March issue, and without determining the square yards per pound. Thus, in the calculation for Fig. 4, the cloth weighed 855.5 grains per square yard. This is equal to 2.85 grains for 1/300th square yard, and with 170 warp and filling threads per inch, the "straight line" calculation is as follows:

170 ÷ 2.85 = 59.6, tariff yarn number.

It will also be evident that the calculation can be based on the weight of larger samples if desired; say a whole cut of cloth, as had been the practice in administering the Payne and other tariffs.

We hope that this explanation of the method of calculating the tariff yarn number as defined by the Underwood law gives "Gera" the information he requires; and that it will convince our other esteemed correspondent that such fabrics as the one shown at Fig. 4 present no special difficulty in the administration of the new cotton schedule.

THE WEATHER AND THE COTTON TARIFF

In determining the tariff yarn number of cotton cloths, the goods should be weighed under uniform conditions as to temperature and humidity. In our April issue we showed that the variation of atmospheric conditions at Boston in July, 1911, and January, 1912, would cause 60s cotton yarn to show a variation of over 7 numbers, from 57.4s to 64.7s, if the tests were made under ordinary conditions without artificial regulation of temperature and humidity. It needs no further evidence to show the necessity for the immediate adoption of uniform regulations for determining tariff yarn numbers at the custom houses. Otherwise the tariff on cotton yarn and cloth will vary widely with the weather and without an act of Congress.

THE STEPLADDER DEFECT

While the tariff yarn number as defined by the Underwood law provides an excellent

basis for the adjustment of duties on different grades of cotton cloths, the new schedule has one serious defect in the stepladder method of advancing the rates as the yarn number becomes higher. We called attention to this defect early in March before the Underwood bill had been reported to the House by the Ways and Means Committee. Nevertheless, as a result of that strange inertia of legislators in the face of self-evident facts, the stepladder classification has withstood the buffetings in the Ways and Means Committee, in the House, in the Finance Committee, in the Senate and in conference, and is now incorporated in the law.

The absurdity of the stepladder method can be made clear by a typical illustration. Ordinarily a single fabric construction of fancy goods is made in a large variety of patterns, which are sold at the same price per yard. Let us assume, for example, that a fabric like that shown at Fig. 4 is made in a pattern in which the tariff yarn number is found to be 40s. It might easily happen that another pattern of the same fabric would require a slightly larger proportion of the coarser threads, enough to reduce the tariff yarn number to 39s. The difference would make no appreciable difference in the cost of the goods, and no difference whatever in the price, and yet, as a result of the dividing line of the stepladder adjustment, the Underwood rate on the first pattern is 20 per cent. and on the second, 15 per cent.

Illustrations of this kind could be extended indefinitely, showing how unimportant changes in construction, such as changes in the proportions of fine and coarse yarns in different patterns, or in the proportion of the threads clipped from the cloth by shearing, will cause very important changes in the Underwood duty. This difficulty would be completely overcome by the progressive adjustment which we recommended in March, and by which the duty is increased by a uniform amount for each additional tariff yarn number. With the progressive method the Underwood bill would provide a perfect system for adjusting tariff rates on cotton cloths to the threads per inch and square yards per pound; that is, to the tariff yarn number.

New Price List for Worsted Combing

The following notice with accompanying list has been given to the worsted trade of Bradford by Woolcombers, Limited, and is of interest to the American trade because of the competitive tariff on tops which will soon go into effect:

11 Foster Sq., Bradford,
July 1, 1913.

Dear Sir:—We beg to advise you that all wools, including lots in work combed on and after October 1st next, will be charged as per tariff attached hereto.

In making this announcement we would point out that the substantial and general increases in wages during the last three years, together with the increased cost of all materials used in the Woolcombing Industry, have made a revision of Combing Rates unavoidable.

Assuring you of our best attention at all times.

Yours respectfully,
Woolcombers Limited.

NEW COMBING TARIFF, AS FROM NOV. 17, 1913

Merinos.—(all above 56s quality.)

	per lb.
Tearing 5 to 1 and over	2½d
Tearing 4 and under 5 to 1	2¾d
Tearing 3 and under 4 to 1	3d
Tearing 2 and under 3 to 1	3¼d
Tearing under 2 to 1	3½d
Burring	extra ¼d
Gilling in	extra ¼d

Carding Crossbreds

56s	2d
Burring	extra ⅛d
Gilling in	extra ¼d
50s	
Tearing 7 to 1 and over	1⅞d
Tearing 5 and under 7 to 1	2d
Tearing under 5 to 1	2⅛d
Burring	extra ⅛d
Gilling in	extra ¼d
30s to 46s	
Tearing 8 to 1 and over	1⅝d
Tearing 6 and under 8 to 1	1¾d
Tearing under 6 to 1	1⅞d
Burring	extra ⅛d
Gilling in	extra ¼d
Carding, Backwashing and Gilling only	1⅜d

Preparing

32s, 36s, 40s	1¼d
Over 40s	1⅜d
Slipe and Skin Wools	extra ⅛d
Burry and Seedy Wools	extra ¼d
Gilling in	extra ¼d
Scotch Wools	1⅜d
Scouring Wools	as washed ⅝d

All previous lists and arrangements cancelled.

The exports of wool from Australia for the month of July were valued at $5,458,180, an increase of $2,779,920.

The Lindquist "Pure Textile" Bill.

Several so-called "pure textile" bills have been introduced at the present session of Congress. Probably the one over which the most noise has recently been made is the bill introduced in the House by Congressman Lindquist, of Michigan, who is engaged in the manufacture of clothing at Greenville and Muskegon, Mich., and New York City. This Lindquist bill provides:

> That it shall be unlawful for any person to misrepresent in manufacturing, selling, trading, or exchanging any fabric or article hereinafter named of wool, cotton, silk, linen, fiber, or leather, in whole or in part, which is misbranded within the meaning of this Act, to wit: Men's, women's, children's clothing, underwear, hosiery, shirts, shirt waists, lingerie, night robes, bath robes, pajamas, sweaters, corsets, shawls, gloves, handkerchiefs, mittens, blankets, quilts, and all bed furnishings, rugs, carpets, curtains, draperies, tablecloths, table covers, napkins, doilies, dresser covers, towels, and all textile fabrics sold by the bolt or yard; boots, shoes, sandals, leggings, grips, handbags, valises, trunks, gloves, mittens, belts, cushions, buggies, auto tops, harness, and all furniture made in part of leather; and any person who shall violate any of the provisions of this section shall be guilty of a misdemeanor, and for the first offense shall, upon conviction thereof, be fined not to exceed $2,000, or shall be sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court; and for each subsequent conviction thereof shall be fined not to exceed $5,000, or sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court.

The bill then goes on to state "the meaning of the Act," which among many other impossible requirements provides for the following:

> That the term "pure wool" as used in this Act shall be held to mean sheep's wool which has not been previously used in the manufacture of any other article or fabric.
>
> That all wool fabrics or articles designated in section one of this Act which are composed wholly of pure wool shall be marked, tagged, or labeled in plain letters "pure wool," and that all fabrics and articles composed in part of pure wool, pure silk, pure cotton, pure linen, or any other vegetable animal, or mineral substances shall be marked, tagged, or labeled in plain letters showing all constituents contained therein.

The enforcement of this "pure wool" provision is so far beyond the limits of the possible as to be absurd. It is an affront to the reader's intelligence to assume that he or she does not know that there is no way of determining how much material in a wool fabric has been previously used in the manufacture of any other article.

Notwithstanding its absurdity the bill is continually held up in the press of the country as being second only in importance to the pure food law for the protection of the public. Food and clothing fall far short of supplying parallel conditions so far as label legislation is concerned. The pure food law provides for certain standards of purity for the protection of the public, because the enforcement of such standardization is not only necessary, but possible.

In the case of textiles, standardization and purity are enforceable only in a limited degree. The sections given above from the Lindquist bill are an illustration of the impossibility of such measures as the Lindquist and Murdock proposals. Textiles are undoubtedly subject to adulteration that, like the adulteration of food, is an evil that can and should be prohibited by specific statutes. For example, a Massachusetts law, approved on May 18, 1900, forbids under penalty of fine the sale of dress goods containing more than 1/100th grain of arsenic per square yard. The object of this law is entirely justifiable. For years there have been a large number of accidents in Great Britain, many of them fatal, caused by the flannelette garments of children catching fire, and recently the House of Commons has been considering definite measures to protect the public against the sale of dangerously inflammable flannelette. Many other cases similar to these can be given, where the law can and should protect the public against certain evils in the manufacture and sale of textiles. But this fact in no way justifies the Lindquist and Murdock bills which require that all textiles shall be labeled to show of what materials they are composed.

The prevention of fraud between buyers and sellers is not the exclusive duty of the government. The individual has something else to do in the matter besides reading a label on the articles offered for sale. The government and the individual should cooperate in this matter. A law on the lines of the British Merchandise Marks Act

should forbid misrepresentation, and then the individual should do his or her part to require tradesmen and manufacturers to obey the law. The following extract from the British Merchandise Marks Act illustrates the principle of the required legislation:

> Every person who applies any false trade description to goods (or causes it to be done) shall, subject to the provisions of this Act, and unless he proves that he acted without intent to defraud, be guilty of an offense against this Act.
>
> Every person guilty of an offense against this Act shall be liable—
>
> (1) On conviction on indictment, to imprisonment, with or without hard labor, for a term not exceeding two years, or to fine, or to both imprisonment and fine; and
>
> (2) On summary conviction to imprisonment, with or without hard labor, for a term not exceeding four months, or to a fine not exceeding twenty pounds, and in case of a second or subsequent conviction to imprisonment, with or without hard labor, for a term not exceeding six months, or to a fine not exceeding fifty pounds.
>
> The expression "trade description" means any description, statement, or other indication, direct or indirect.
>
> (a) As to the number, quantity, measure, gauge, or weight of any goods, or
>
> (b) As to the place or country in which any goods were made or produced, or
>
> (c) As to the mode of manufacturing or producing any goods, or
>
> (d) As to the material of which any goods are composed, or
>
> (e) As to any goods being the subject of an existing patent, privilege, or copyright, and the use of any figures, word, or mark which, according to the custom of the trade, is commonly taken to be an indication of any of the above matters, shall be deemed to be a trade description within the meaning of this Act.

With a general law of that character on the statute book and supplemented by specific acts that may be necessary and practicable, like the Massachusetts arsenic law already mentioned, the necessary protection of the public would be assured.

A Merchandise Marks Act of that kind would apply, not only to textiles and leather goods, but to all kinds of merchandise; would prevent all misrepresentation and fraud that could by any possibility be prevented by such measures as the Lindquist and Murdock bills; and all without the cumbersome and expensive department of administration that those two bills would make necessary.

A law modeled after the British act would avoid putting a premium on fraud by requiring labels stating the composition to be attached to goods in cases where it is impossible to detect and punish deception by determining the actual composition. Under the Lindquist and Murdock bills imported textiles, such, for example, as those made of wool and shoddy could be labeled "pure wool" without the possibility of detecting the fraud. This fraud could be practiced in the case of domestic goods, with detection so difficult as to be impossible.

By a curious chance the daily newspapers have recently reported incidents in which Mr. Lindquist himself has figured, and which serve as illustrations of the fundamental defect of his proposed measure. A few weeks ago the Boston papers told of a call made at the White House by Mr. Lindquist, who carried along with him a heavily loaded valise. When he approached the entrance to the President's office the secret service men, to whom the Congressman was a stranger, took possession of the satchel and after cautiously opening it, scattered its harmless contents over the floor, displaying in great variety the textile and leather articles enumerated in the Lindquist bill. Mr. Lindquist was on his way to meet President Wilson and convince him of the need of the Lindquist "pure textile" law. After the secret service men had become satisfied the Congressman was allowed to proceed on his mission.

The officers who took possession of Mr. Lindquist's valise did their duty, and it is the duty of every buyer of wool goods to use his or her best efforts to prevent fraud and misrepresentation. An official label will not take the place of this performance of duty in either case. It would be no more absurd to allow a visitor to the President of the United States to carry a valise with him provided only that it bore a label certifying that the contents were harmless, than it would be to require, as the Lindquist bill does, that textile goods should be labeled to show their composition before they are offered for sale in interstate commerce.

The other incident, in which Congressman Lindquist figured, bears on a different phase of the question. The evils of sweatshop

labor are a proper subject of legislation. Schemes have been devised to require that goods should bear labels showing that they were manufactured under proper labor conditions. Such plans are so clearly impracticable as to fall of their own weight. The government has undertaken instead to prevent the employment of labor in sweatshops. For example, the State of New York has provided laws and organized an inspection bureau to prevent the sweatshop evil. On September 16 the New York Times had this report of a State inspector's visit to an east side sweatshop:

Children at Work on Lindquist Cards.

Women Complain that Labor in Tenements for Congressman's Firm Violates Law.

The Contracts Sublet.

Head of Woolen Concern Asserts His Company is Not Responsible for Employing Young Workers.

Complaints that children are being overworked in the tenements of this city have been received by the State Factory Inspection Bureau, and when a specific complaint was made yesterday by Mrs. Sophie Baer, 343 Saratoga Ave., Brooklyn, that children between the ages of 8 and 13 were compelled to work long hours in a tenement at 167 Second St., Manhattan, Inspector Stewart Owen of the State Factory Department set forth to investigate.

Inspector Owen arrived at the six-story tenement house at 5 o'clock yesterday afternoon. He went to the third floor front and pushed open a door leading into a dingy three-room apartment. Here in one of the rooms he saw several long tables piled high with cardboard and bits of woolen material. There were several pots of glue on the tables and sitting about them with their heads bent over their work were a dozen children. A woman who was directing the work rose to meet the inspector as he entered.

The woman said she was Mrs. Fanny Herman, that she was the wife of Leo Herman, a pedlar, and that it was her apartment in which the children were working. She said they were pasting samples of the woolen materials of various colors onto the cardboard slips and that they were paid for this work at the rate of 75 cents an hour. The children worked, she said, from 3 o'clock in the afternoon until 8 o'clock.

The children said that they sometimes worked longer than this. Several of them slipped out of the room when Inspector Owen entered. Those who stayed gave their names as Rachel and William Hurkowitz, 12 and 10 years old of 173 Second Ave.; Vera and Gerson Friedberg, 12 and 11 years old, of 167 Second Ave., and Harry Herman, 11 years old, the son of the woman accused of hiring the children. The cards on which the woolen samples had been pasted were printed in the most part in Italian, but contained in large letters the English words, "Canada Mills Co., Greenville, Mich." Under these words was a photograph labeled "Congressman Francis O. Lindquist, Washington, D. C." Congressman Lindquist, it was learned later, is president of the Canada Mills Co., of New York, Greenville and Muskegon, Mich.

Desirous of getting at the facts in this matter we wrote Congressman Lindquist asking him if the Times account was correct, and received the following reply:

Canada Mills Company,
Greenville, Mich.,
Sept. 30, 1913.

Editor Textile World Record:

Your letter of September 26th, containing inquiry as regards the article in "The New York Times," came duly to hand.

Twice a year we issue pamphlets with small swatches pasted upon them. The printing and pasting of these we let out by contract to large printing concerns, usually in New York City. We have always tried to be particular in giving our contracts to concerns who are responsible, and also to concerns who do their work under their own roof, as I have always been bitterly opposed to sweat-shop labor. So when this article came out in the "New York Times" it was very much of a surprise to me. I immediately got in touch with the parties to whom our contract was awarded this fall, and they told me they have never given out any work to be done in the homes of the people; but on this occasion, one of their women employes, one who had been with them for a number of years, was ill and had been unable to come to their factory, and out of charity they permitted her to take some of this work home.

The President of the company told me that this woman was practically destitute, and having been in their employ for a number of years, he permitted her to take these pamphlets to her home as an act of charity on his part.

I have gone into this matter thoroughly, and I am unable to find where he has ever sent out any work other than this one lot.

Trusting this will make the matter clear to you, I beg to remain

Yours very truly,
Canada Mills Company,
F. O. Lindquist,
President.

Mr. Lindquist's letter makes it plain that he is opposed to sweatshop labor and was in no way responsible for the fact that his sample cards were being mounted in an east side sweatshop. He did his duty in giving his work to a contractor who, as he supposed, did not employ sweatshop labor. Nevertheless the man did on this occasion send Mr. Lindquist's cards to a sweatshop, and the New York State authorities discovered and put an end to the illegal employ-

ment of children in that particular sweatshop. A law requiring that goods should bear labels stating the conditions under which they had been manufactured, is not a practicable method of preventing the employment of sweatshop labor, which is a matter for the direct intervention by the police power of the State. But labels on goods to prevent the employment of sweatshop labor would not prove any more futile in practice than would most of the provisions in the Lindquist "pure textile" law, which the Michigan statesman evidently hopes to jam through Congress by the aid of the President of the United States. We advise Mr. Lindquist to determine the limits of the possible and the practicable before undertaking to frame legislation of this kind.

The Underwood Textile Schedules.

[Wool, camel hair and wool wastes go on the free list on Dec. 1, 1913. The new rates on mohair, alpaca and manufactures of wool, camel hair, mohair and alpaca, go into effect on Jan. 1, 1914.]

SCHEDULE I—COTTON

Cotton and cotton waste or flocks, free list.

Thread, carded yarn, except spool thread of cottcn, crochet, darning and embroidery cotton: Not combed, bleached, dyed, mercerized or colored, the rates are shown by the chart, Fig. 1. Combed, bleached, dyed, mercerized or colored, 2 1/2 per cent. in addition to the rates shown by the chart, Fig. 1.

Spool thread of cotton, crochet, darning and embroidery cottons, in any form, 15 per cent.

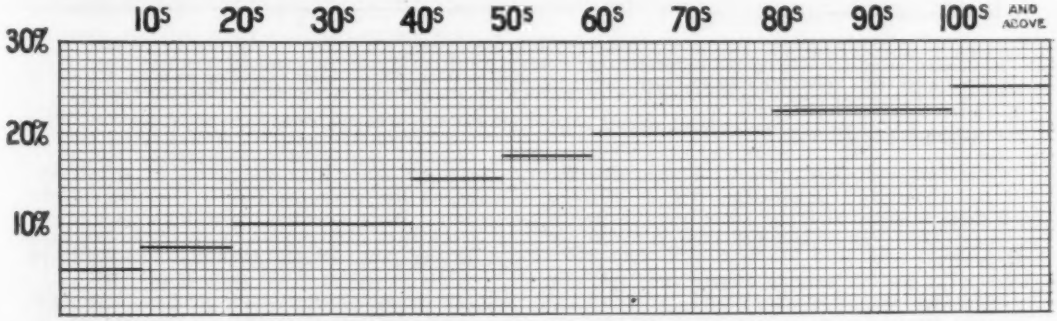


Fig. 1. The heavy lines indicate the Underwood rates on cotton yarn, not combed, bleached, dyed, mercerized, or colored: up to and including 9s, 5 per cent; exceeding 9s to 19s, 7½ per cent; exceeding 19s to 3 s, 10 per cent; exceeding 39s to 49s, 15 per cent; exceeding 49s to 59s, 17½ per cent; exceeding 59s to 79s, 20 per cent; exceeding 79s to 99s, 22½ per cent; exceeding 99s, 25 per cent.
When combed, bleached, dyed, mercerized, or colored: 2½ per cent. in addition to above rates.

Cloth: Not bleached, dyed, colored, stained, painted, printed, woven figured or mercerized: The rates are shown by the chart, Fig. 2. Bleached, dyed, colored, stained, painted, printed, woven figured, or mercerized: The rates are 2 1/2 per cent. in addition to those shown by the chart, Fig. 2.

Cloth composed of cotton or other vegetable fiber and silk, whether known as silk-striped sleeve linings, silk stripes, or otherwise, of which cotton or other vegetable fiber is the component material of chief value, 30 per cent.

Tracing cloth, 30 per cent.

Cotton cloth, filled or coated, 25 per cent.

Oilcloths (except silk oilcloths and oilcloths for floors), 25 per cent.

Window hollands, 25 per cent.

Waterproof cloths, of which cotton or other vegetable fiber is the material of chief value, or of cotton or other vegetable fiber and india rubber, 25 per cent.

Handkerchiefs or mufflers, not specially provided for: Not hemmed, 25 per cent.; hemmed or hemstitched, 30 per cent.

Wearing apparel not otherwise specially provided for, of which cotton or other vegetable fiber is the material of chief value, or of cotton or other vegetable fiber and india rubber, 30 per cent.

All the foregoing, composed of cotton in combination with flax, hemp or ramie, or of cotton with flax, hemp or ramie and india rubber, 35 per cent.

Shirt collars and cuffs, not specially provided for, 30 per cent.

Plushes, velvets, plush or velvet ribbons, velveteens, corduroys, and all pile fabrics, cut or uncut, whether or not the pile covers the entire surface; and composed wholly or in chief value of cotton or other vegetable fiber, except flax, hemp or ramie; articles made or cut

from such goods, including bias dress facings, 40 per cent.

Curtains, table covers, articles composed wholly or in chief value of cotton chenille, tapestries, and other jacquard figured upholstery goods, composed wholly or in chief value of cotton or other vegetable fiber, in the piece or otherwise, 35 per cent.

All other jacquard figured manufactures, composed wholly or in chief value of cotton, 30 per cent.

Stockings, hose and half hose, composed of cotton or other vegetable fiber, not otherwise specially provided for, 20 per cent.

Stockings, hose and half hose, selvedged, fashioned, narrowed or shaped on knitting machines or knit by hand, including seamless stockings, hose and half hose, and clocked stockings, hose and half hose, finished or unfinished, composed of cotton or other vegetable fiber: Valued at not more than 70 cents per dozen pairs, 30 per cent. Valued at more than 70 cents and not more than $1.20, 40 per cent. Valued at more than $1.20, 50 per cent.

Underwear, and all wearing apparel, not specially provided for, made wholly or in part on knitting machines, or knit by hand, finished or unfinished, not including such as are trimmed with lace, imitation lace or crochet, or as are embroidered, composed of cotton or other vegetable fiber, 30 per cent.

Bandings, belts, beltings, bindings, bone casings, cords, tassels, cords and tassels, garters, tire fabric or fabric suitable for use in pneumatic tires, suspenders and braces, and fabrics with fast edges not exceeding twelve inches in width, composed wholly or in chief value of cotton or other vegetable fiber and india rubber, not embroidered: spindle banding, woven, braided, or twisted lamp, stove, or candle wicking made of cotton or other vegetable fiber; loom harness, healds, or collets, composed wholly or in chief value of cotton or other vegetable fiber; boot, shoe and corset lacings made of cotton or other vegetable fiber; and labels for garments or other articles, composed of cotton or other vegetable fiber, 25 per cent.

Belting for machinery made of cotton or other vegetable fiber and india rubber, or of which cotton or other vegetable fiber is the component material of chief value, 15 per cent.

Table damask, and manufactures of table damask, composed wholly or in chief value of cotton, not specially provided for, 25 per cent.

Towels, bath mats, quilts, blankets, polishing cloths, mop cloths, wash rags or cloths, sheets, pillow cases, and batting, composed wholly or in chief value of cotton, not embroidered nor in part of lace, and not otherwise provided for, 25 per cent.

Lace window curtains, pillow shams, and bed sets, finished or unfinished, made on the Nottingham lace-curtain machine, and composed of cotton or other vegetable fiber; when counting not more than six points or spaces between the warp threads to the inch, 35 per cent. When counting more than six and not more than eight points or spaces to the inch, 40 per cent. When counting nine or more points or spaces to the inch, 45 per cent.

All articles and manufactures composed in chief value of cotton, not specially provided for, 30 per cent.

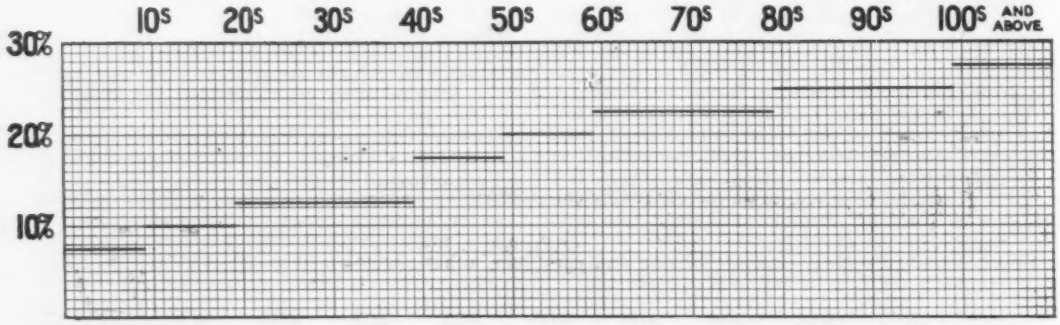


Fig. 2. The heavy lines indicate the Underwood rates on cotton cloth, not bleached, dyed, colored, stained, painted, printed, woven figured, or mercerized: cloths of which the average yarn number does not exceed 9s, 7½ per cent; exceeding 9s to 19s, 10 per cent; exceeding 19s to 39s, 12½ per cent; exceeding 39s to 49s, 17½ per cent; exceeding 49s to 59s, 20 per cent; exceeding 59s to 79s, 22½ per cent; exceeding 79s to 99s, 25 per cent; exceeding 99s, 27½ per cent.

When bleached, dyed, colored, stained, painted, printed, woven figured, or mercerized: 2½ per cent. in addition to above rates.

SCHEDULE J—FLAX, HEMP AND JUTE

Flax straw: Flax, not hackled or dressed; flax hackled, known as "dressed line," tow of flax and flax noils; hemp, and tow of hemp; hemp hackled, known as "line of hemp," free list.

Grasses and fibers: Istle or Tampico fiber, jute, jute butts, manila, sisal grass, sunn, and all other textile grasses or fibrous vegetable substances, not dressed or manufactured in any manner, and not specially provided for, free list.

Single yarns made of jute: Not finer than five lea or number, 15 per cent. If finer than five lea or number and yarns made of jute not otherwise specially provided for, 20 per cent.

Cables and cordage, composed of istle, Tampico

fiber, manila, sisal grass or sunn, or a mixture of these or any of them, 1/2 cent per pound. Cables and cordage made of hemp, tarred or untarred, 1 cent per pound.

Threads, twines, or cords, made from yarn. Not finer than five lea or number, composed of flax, hemp, or ramie, or of which these substances or any of them is the component material of chief value, 20 per cent. If made from yarn finer than five lea or number, 25 per cent.

Single yarns, made of flax, hemp or ramie, or a mixture of any of them, not finer than eight lea or number, 12 per cent. Finer than eight lea or number and not finer than eighty lea or number, 20 per cent. Finer than eighty lea or number, 10 per cent.

Ramie sliver or roving, 15 per cent.

Binding twine, manufactured from New Zealand hemp, manila, istle or Tampico fiber, sisal grass, or sunn, or a mixture of any two or more of them, of single ply and measuring not exceeding seven hundred and fifty feet to the pound, free list.

Coir, or coir yarn, free list.

Gill nettings, nets, webs and seines made of flax, hemp, or ramie, or a mixture of any of them, or of which any of them is the component material of chief value, 25 per cent.

Floor mattings, plain, fancy, or figured, including mats and rugs, manufactured from straw, round or split, or other vegetable substances, not otherwise provided for in this section, and having a warp of cotton, hemp, or other vegetable substances, including what are commonly known as China, Japan, and India straw matting, 2 1/2 cents per square yard.

Carpets, carpeting, mats and rugs made of flax, hemp, jute or other vegetable fiber (except cotton), 30 per cent.

Plain woven fabrics of single jute yarns by whatever name known, not bleached, dyed, colored, stained, printed, or rendered non-inflammable by any process; and waste of any of the above articles suitable for the manufacture of paper, free list.

Hydraulic or flume hose, made in whole or in part of cotton, flax, hemp, ramie or jute, 7 cents per pound.

Tapes composed wholly or in part of flax, woven with or without metal threads, designed expressly for use in the manufacture of measuring tapes, 20 per cent.

Linoleum, plain, stamped, painted, or printed, including corticine and cork carpet, figured or plain, also linoleum known as granite and oak plank, 30 per cent. Inlaid linoleum, 35 per cent.

Oilcloth for floors, plain, stamped, painted, or printed, 20 per cent. Mats or rugs made of oilcloth, linoleum, corticine, or cork carpet shall be subject to the same rate of duty as herein provided for carpets composed of those materials.

Shirt collars and cuffs, composed in whole or in part of linen, 30 per cent.

Bands, bandings, belts, belting, bindings, cords, ribbons, tapes, webs and webbings, composed wholly of flax, hemp, or ramie, or of flax, hemp, or ramie and india rubber, and not otherwise provided for, 30 per cent.

Wearing apparel composed wholly of flax, hemp, or ramie, or of flax, hemp, or ramie and india rubber, 40 per cent.

Plain woven fabrics of single jute yarns, by whatever name known, bleached, dyed, colored, stained, painted, printed, or rendered non-inflammable by any process, 10 per cent.

Pile fabrics, whether or not the pile covers the entire surface, composed wholly or in chief value of flax, hemp or ramie, and all articles made from such fabrics not specially provided for, 40 per cent.

Bags or sacks made from plain woven fabrics, of single jute yarns, not dyed, colored, stained, painted, printed or bleached, 10 per cent.

Handkerchiefs composed wholly or in chief value of flax, hemp or ramie, finished or unfinished. Not hemmed or hemmed only, 35 per cent. If hemstitched, or imitation hemstitch, or revered, or with drawn threads, but not embroidered, initialed, or in part of lace, 40 per cent.

Plain woven fabrics, not including articles, finished or unfinished, composed wholly or in chief value of flax, hemp or ramie, including shirting cloth, 30 per cent.

All woven articles, finished or unfinished, and all manufactures, composed wholly or in chief value of flax, hemp, ramie, or other vegetable fiber, not specially provided for, 35 per cent.

Istle or tampico, when dressed, dyed or combed, 20 per cent.

SCHEDULE K—WOOL

Wool and camel hair, whether in grease, scoured or carbonized, free list.

Wool wastes, noils, shoddy, flocks, whether carbonized or not, free list.

Hair of the Angora goat, alpaca and other like animals, 15 per cent.

Tops and roving, composed wholly or in part of wool or camel hair, 8 per cent.

Tops made from the hair of the Angora goat and alpaca, 20 per cent.

Yarns made wholly or in chief value of wool, 18 per cent.

Yarns made from hair of Angora goat or alpaca, 25 per cent.

Cloths, knit fabrics, felts not woven, and all manufactures composed wholly or in chief value of wool, 35 per cent.

Cloths and all manufactures composed wholly or in chief value of the hair of the Angora goat or alpaca, not specially provided for, 40 per cent.

Press cloths composed of camel's hair, imported expressly for oil milling purposes and marked so as to indicate that it is for such purposes, and cut into lengths not to exceed seventy-two inches and woven in widths not under ten inches nor to exceed fifteen inches and weighing not less than one-half pound per square foot, free list.

Cloths if made in chief value of cattle hair or horse hair, not specially provided for, 25 per cent.

Plushes, velvets, and all other pile fabrics, cut or

uncut, woven or knit, whether or not the pile covers the entire surface, made wholly or in chief value of wool, and articles made wholly or in chief value of such fabrics, 40 per cent.

Plushes, velvets, and all other pile fabrics, cut or uncut, woven or knit, whether or not the pile covers the entire surface, made wholly or in chief value of the hair of the Angora goat or alpaca, and articles made wholly or in chief value of such fabrics, 45 per cent.

Stockings, hose and half hose, made on knitting machines or frames, composed wholly or in chief value of wool, 20 per cent.

Stockings, hose and half hose, selvedged, fashioned, narrowed, or shaped wholly or in part by knitting machines or frames, or knit by hand, seamless stockings, hose and half hose, and clocked stockings, hose and half hose, gloves and mittens, all of the above, composed wholly or in chief value of wool, if valued at not more than $1.20 per dozen pairs, 30 per cent. If valued at more than $1.20 per dozen pairs, 40 per cent. Press cloth composed of camel's hair, 10 per cent.

Blankets not specially provided for and flannels, composed wholly or in chief value of wool, 25 per cent.

Flannels composed wholly or in chief value of wool, valued at above 50 cents per pound, 30 per cent.

Women's and children's dress goods, coat linings, Italian cloths, bunting, and goods of similar description and character, composed wholly or in chief value of wool, and not specially provided for, 35 per cent.

Clothing, wearing apparel, knitted and woven shawls, and knitted articles, not specially provided for, composed wholly or in chief value of wool, 35 per cent.

Webbings, suspenders, braces, bandings, belts, beltings, bindings, cords, cords and tassels, and ribbons; any of the foregoing made of wool or of which wool or wool and india rubber are the component materials of chief value, and not specially provided for, 35 per cent.

Aubusson, Axminster, moquette and chenille carpets, 35 per cent.

Saxony, Wilton and Tournay velvet carpets, 30 per cent.

Brussels carpets, 25 per cent.

Velvet and tapestry velvet carpets, printed on the warp or otherwise, 30 per cent.

Tapestry Brussels carpets, printed on the warp or otherwise, 20 per cent.

Treble ingrain, three-ply, and all-chain Venetian carpets, 20 per cent.

Wool Dutch and two-ply ingrain carpets, 20 per cent.

Carpets, woven whole for rooms and Oriental, Berlin, Aubusson, Axminster and similar rugs, 50 per cent.

Druggets and bockings, 20 per cent.

Carpets and carpeting of wool or cotton, or composed in part of either of them, mats, mattings and rugs of cotton, 20 per cent.

Mats, rugs for floors, screens, covers, hassocks, bed sides, art squares, and other portions of carpets, composed wholly or in part of wool, same rate as on carpeting of like character.

SCHEDULE L—SILK

Silk cocoons and silk waste, free list.

Silk, raw, in skeins reeled from the cocoon, or rereeled, but not wound, doubled, twisted, or advanced in manufacture in any way, free list.

Silk partially manufactured from cocoons or from waste silk and not further advanced or manufactured than carded or combed silk, and silk noils exceeding two inches in length, 20 cents per pound.

Spun silk yarn, 35 per cent.

Thrown silk not more advanced than singles, tram, or organzine, sewing silk, twist, floss, and silk threads or yarns of every description made from raw silk, 15 per cent.

Velvets, plushes, chenilles, velvet or plush ribbons, or other pile fabrics, composed wholly or in chief value of silk, 50 per cent.

Handkerchiefs, composed wholly or in chief value of silk; if cut, not hemmed or hemmed only, 40 per cent.; if hemstitched or imitation hemstitched or revered, or having drawn threads, but not embroidered, 50 per cent.

Ribbons, bandings, including hat bands, belts, beltings, bindings, all of the foregoing not exceeding twelve inches in width and if with fast edges, bone casings, braces, cords, cords and tassels, garters, suspenders, tubings, and webs and webbings, composed wholly or in chief value of silk, or of silk and india rubber, if not embroidered and not specially provided for, 45 per cent.

Clothing, including knit goods, composed wholly or in chief value of silk or of silk and india rubber, not specially provided for, 50 per cent.

Woven fabrics, composed wholly or in chief value of silk or of silk and india rubber, not specially provided for, 45 per cent.

Bolting cloths composed of silk, imported expressly for milling purposes, and so permanently marked as not to be available for any other use, free list.

Yarns, threads, filaments or artificial or imitation silk, or of artificial or imitation horsehair, 35 per cent.

Beltings, cords, tassels, ribbons, or other articles or fabrics composed wholly or in chief value of yarns, threads, filaments, or fibers of artificial or imitation silk, or of artificial or imitation horsehair, or of yarns, threads, filaments or fibers of artificial or imitation silk, or of artificial or imitation horsehair and india rubber, 60 per cent.

SCHEDULE N—SUNDRIES

Braids, featherstitch braids, fringes, gimps, gorings, all the foregoing of whatever material composed, and articles made wholly or in chief value of any of the foregoing not specially provided for, 50 per cent.

Ramie hat braids, 40 per cent.

Manufactures of ramie hat braids, 50 per cent.

Braids, plaits, laces, willow sheets or squares, composed wholly or in chief value of straw, chip, grass, palm leaf, willow, osier, rattan, real horsehair, cuba bark, or manila hemp, suitable for making or ornamenting hats, bonnets, or hoods, not bleached, dyed, colored, or stained, 15 per cent. If bleached, dyed, colored, or stained, 20 per cent.

Hats, bonnets and hoods composed wholly or in chief value of straw, chip, grass, palm leaf, willow, osier, rattan, cuba bark, or manila hemp, whether wholly or partly manufactured, but not blocked or trimmed, 25 per cent. If blocked or trimmed, and in chief value of such materials, 40 per cent.

Human hair, raw, 10 per cent. If cleaned, or commercially known as drawn, but not manufactured, 20 per cent. Manufactures of human hair, including nets and nettings, composed wholly or in chief value of human hair, 35 per cent.

Hair, curled, for beds or mattresses, 10 per cent.

Haircloth, known as "crinoline" cloth, 6 cents per square yard. Haircloth, known as "hair seating" and hair press cloth, 15 cents per square yard.

Laces, lace curtains, not specially provided for, coach laces, and all lace articles; handkerchiefs, napkins, wearing apparel, and other articles or fabrics, made wholly or in part of lace or of imitation lace, embroideries, wearing apparel, handkerchiefs, and all articles or fabrics, embroidered by hand or machinery; edgings, insertions, gallons, nets, nettings, veils, veilings, neck rufflings, ruchings, tuckings, flouncings, flutings, quillings, ornaments; braids, loom woven and ornamented in the process of weaving, or made by hand, or on any braid machine, knitting machine, or lace machine, and not specially provided for; trimmings not specially provided for; woven fabrics or articles from which threads have been omitted, drawn, punched, or cut, and with threads introduced after weaving, forming figures or designs, not including straight hemstitching; and articles made in whole or in part of any of the foregoing fabrics or articles; all of the foregoing of whatever yarns, threads, or filaments composed, 60 per cent.

Manufactures composed wholly or in chief value of asbestos, not specially provided for, 10 per cent.

Yarns and woven fabrics, composed wholly or in chief value of asbestos, 20 per cent.

MISCELLANEOUS

Alizarin, natural or synthetic, and dyes obtained from alizarin, anthracene, and carbazol, free list.

Asbestos, unmanufactured, free list.

Bagging for cotton, gunny cloth, and similar fabrics, suitable for covering cotton, composed of single yarns made of jute, jute butts, aloe, mill waste, cotton tares, or other material not bleached, dyed, colored, stained, painted, or printed not exceeding sixteen threads to the square inch, counting the warp and filling, and weighing not less than fifteen ounces per square yard, free list.

Indigo, natural or synthetic, dry or suspended in water, and dyes obtained from indigo, free list.

Paper stock, crude, of every description, including all grasses, fibers, rags, waste, including jute, hemp and flax waste, shavings, clippings, old paper, rope ends, waste rope, and waste bagging, and all other waste not specially provided for, including old gunny cloth and old gunny bags, used chiefly for paper making, free list.

Rags, not specially provided for, free list.

Wearing apparel, articles of personal adornment, toilet articles, and similar personal effects of persons arriving in the United States, free list.

But this exemption shall include only such articles as were actually owned by them and in their possession abroad at the time of or prior to their departure from a foreign country, and as are necessary and appropriate for the wear and use of such persons and are intended for such wear and use, and shall not be held to apply to merchandise or articles intended for other persons or for sale.

Felts, adhesive, for sheathing vessels, free list.

Hair of horse, cattle and other animals, cleaned or uncleaned, drawn or undrawn, but unmanufactured, not specially provided for, free list.

Hoop or band iron, or hoop or band steel, cut to lengths, or wholly or partly manufactured into hoops or ties, coated or not coated with paint or any other preparation, with or without buckles or fastenings, for baling cotton or any other commonity, free list.

Needles, hand sewing and darning, and needles for shoe machines, free list.

Sheep and goat skins, undressed, free list.

Tinsel wire, lame or lahn, made wholly or in chief value of gold, silver, or other metal, 6 per cent. Bullions and metal threads, made wholly or in chief value of tinsel wire, lame or lahn, 25 per cent. Fabrics, ribbons, beltings, toys, or other articles, made wholly or in chief value of tinsel wire, lame or lahn, or of tinsel wire, lame or lahn, and india rubber, bullions, or metal threads, not specially provided for, 40 per cent.

Card clothing not actually and permanently fitted to and attached to carding machines or to parts thereof at the time of importation, when manufactured with round iron or untempered round steel wire, 10 per cent. When manufactured with tempered round steel wire, or with plated wire or other than round iron or steel wire, or with felt face, or wool face, or rubber face cloth containing wool, 35 per cent.

Jacquard designs on ruled paper, or cut on jacquard cards, and parts of such designs, cardboard and bristol board, press boards or press papers, paper hangings with paper back or composed wholly or in chief value of paper, 25 per cent.

Needles for knitting or sewing machines, latch needles, crochet needles, and tape needles, knitting and all other needles not specially provided for, 20 per cent.

Embroidering machines, and lace-making machines, including machines for making lace curtains, nets, or nettings, 25 per cent.

Articles not specially provided for, if composed wholly or in chief value of iron, steel, lead, copper, brass, nickel, pewter, zinc, aluminum, or other metal, but not plated with gold or silver, and whether partially or wholly manufactured, 20 per cent.

Autumn Meeting of the National Association of Cotton Manufacturers.

The semi-annual meeting of the National Association of Cotton Manufacturers was held in Atlantic City, N. J., from September 30th to October 2nd. Nearly two hundred members and guests, including about thirty ladies, were registered.

EDWIN FARNUM GREENE, PRESIDENT OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS

The headquarters of the convention were at the Hotel Chalfonte, finely situated on the Board Walk, facing the ocean and centrally located for all points of attraction.

The many features of interest in this world-famous resort were strong competitors for the attention of the members with the business meetings and the attendance at

the latter was not what it should have been in justice to the excellent program which had been prepared and which merited greater appreciation by the presence of larger numbers. It is well recognized, however, that wide publicity is given to the papers presented through the textile press and in the printed "transactions" of the Association. The autumn meeting naturally partakes more of a social nature than the annual meeting in the spring, giving an opportunity of getting together, meeting old friends, making new acquaintances and enjoying the chance for recreation and outdoor amusement which the autumn convention presents.

ALBERT E. DUNCAN, VICE-PRESIDENT OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS.

At the opening session of the convention on Tuesday evening the Convention was welcomed to Atlantic City by Daniel H. Bell, city clerk of Atlantic City, and on the part of the Business Men's League, by J. W. Salus, its president. These gentlemen painted in graphic terms the charms of the "City-by-the-Sea" and extended a cordial welcome. Albert E. Duncan, vice-president of the Association, responded most appropriately and in a bright vein of humor.

President Greene then delivered his opening address, which was short and to the point. The underlying thought was of making the best of the present situation and trying to meet new conditions with an opti-

mistic spirit and determination to give the new tariff a fair trial.

At the conclusion of the president's address, the president and the guests of the Association held a reception for the members and their guests, which was followed by light refreshments. This served to bring the members together socially at the beginning of the session and was well attended.

At the second session on Wednesday, Secretary Woodbury read the paper on "Dacca Muslins" presented by E. N. Murti, of Madras, India.

Thomas Aspinall, a manufacturing and consulting chemist of Bolton, England, was present and read his interesting paper on "Sizing for Cotton Warps". There was some discussion on Mr. Aspinall's paper and he was asked to explain several points further, particularly in regard to the use of tallow.

In the absence of D. E. Douty, his paper on "Results of Moisture Testing" was presented by the secretary.

The second report of the Committee on Conditioning of Cotton Yarn and Cloth, which was expected to be read at this session, was not ready in time for the meeting and will appear in the "Transactions of the Association". It is understood that the report will recommend the importance and necessity of conditioning tests for cotton and will suggest that the United States Conditioning & Testing Co. of New York City might be appointed the official testing house.

The third session, on Wednesday afternoon, was a short one as L. H. Kunhardt's paper on "Precautions for Safety in Factories" was the only one read by the author in person. The paper on "The Cotton Spinning Industry in Russia" did not arrive in time for presentation and will be published in "Transactions". A very valuable contribution came from Professor William Henry Perkins, Manchester, England, on "Permanent Fire-proofing of Cotton Goods," to which he has given much attention and the satisfactory result of his experiments gives to the general public a process which has already in England resulted in greater safety in the use of cotton dress materials, particularly flannelets. The paper on "Industrial Accidents: Their Compensation and Prevention," by Carl M. Hansen, touches on a subject that should have the careful consideration of every manufacturer. When the legislatures of most of the manufacturing states are hastening to pass labor laws without careful consideration of their need or effect, it is the duty of manufacturers to avail themselves of all the information on this subject that can be used to show the true facts and the real needs. Mr. Hansen's paper is a valuable contribution to the literature on this subject.

The fourth session on Thursday morning opened with William Whittam's paper on "The New Tariff and Foreign Competition". The advice that Mr. Whittam had to give was that American manufacturers must study their competitors' methods of selling and distributing their products, for in that direction lay the greatest opportunity for efficiency and reduction of expense between the manufacturer and the consumer. The definite suggestion he made was for the establishment of a central textile exchange on the lines of the Manchester Cotton Exchange.

R. M. Miller, Jr., asked what Mr. Whittam thought of the effect of the new tariff and he said that he thought fine counts would be affected first and coarse counts last. One reason that England sold fine counts so much cheaper than we could make them was because fine count mills restricted their product to a very few numbers, some mills running entirely on one count, while our fine count mills have a wider range.

Mr. Lord inquired as to further details in regard to the expense of handling goods by agents who sold for the weavers, stating that, if these agents were simply middlemen between the weavers and the converters, the 4 per cent. charge, covering discount and broker's commission, was no advantage over the American practice, so there would hardly be any economy there.

Clinton H. Scovell's paper was aimed to point out the basis of the new idea underlying the present modern methods of professional accountants. While recognizing the necessity and the value of accounting merely from the auditing point of view, the greatest

benefit of the new methods of cost keeping and clear accounting lay in the fact that they were essential aids to efficient mill management and should be designed to keep the manager in daily touch with the production of his mill and expenses and costs of every department. W. F. Parish presented a paper bearing on "Recent Developments in Lubrication," due to the use of the new Southern Crudes of heavy specific gravity. While his paper was very largely of a technical nature, the main point he brought out was that the heavy crudes possess great lubricating value.

The fifth and last session was held on Thursday evening. In the absence of President Greene, Vice-President Duncan took the chair.

At this session the election of new members took place. The members, a list of whom appears elsewhere, were unanimously elected. The Committee on Resolutions, of which Frederick A. Flather was chairman, presented its report, which extended the thanks of the Association to those who had participated to make it a success. The principal feature of the evening session was an illustrated talk on the "Advantages of Commercial Motor Cars in Cotton Manufacture," by Day Baker. The stereopticon views of motor trucks in actual use in cotton mill yards demonstrated what was actually being done in this way and showed what rapid steps had been made in the past few years in these lines. George S. Pope presented a paper on "Purchasing Coal under Specifications" and Dudley Willcox on "The Care of Belts in Cotton Mills".

The various addresses, delivered at the convention, are presented in the following pages.

A number of Southern manufacturers were present including members of the National Council which is composed of delegates from the American Cotton Manufacturers' Association and the National Cotton Manufacturers' Association. A Council meeting was held on Wednesday evening attended by Messrs. Cramer, Cone, Tyson and Bryant representing the American and Messrs. Greene, Duncan, Hobbs and Woodberry representing the National Association. Several subjects of importance were considered, but no definite conclusions reached. Another meeting will be held soon, when it is expected that some important measures in connection with the administrative features of the new tariff bill may be announced.

The majority of the New England members, about one hundred in number, made the trip to Atlantic City with the special excursion party under the management of the Raymond-Whitcomb Company. Private cars were attached to the Fall River boat train from Boston Monday evening and on the arrival of the boat in New York, the party was transferred to a steamer which carried them down the harbor and bay to Atlantic Highlands, where a special train was waiting to carry them over the Shore Line to Atlantic City, which was reached in time for luncheon. This trip was a pleasant feature as the weather was fine and every arrangement made for comfort. The return journey was made by a special train from Atlantic City to New York Monday morning and then by Fall River Boat to Boston.

While the weather was not all that could be wished for, there was enough sunshine to give those making their first visit a proper impression of the attractions of Atlantic City. The program had been arranged so that portions of each day should be free for amusement. While there were no special social features arranged at the headquarters hotel after the opening night, there were social gatherings in large numbers at the "Million Dollar Pier," Old Vienna and "Barneys" which at times almost took on an official character so representative and numerous was the attendance at these evening sessions. Several special programs were planned in honor of the Association by enterprising amusement managers and souvenirs distributed ranging from pearl scarf pins to live guinea pigs.

The Committee on Meeting consisted of Messrs. Churchill Hungerford, Chairman; George A. Ayer, Dr. Edward W. France, Simon Friedberger, Earl S. Jenckes, William H. Loftus, William L. Lyall, George F. Steele and William T. Westerman.

This committee also had charge of the golf contests for the cups offered by the

Board of Government to be played for at the autumn meeting.

The golf links are at the Country Club several miles distant, and on Tuesday, Wednesday and Thursday afternoons many of the members went over the course in competition for these cups.

The heavy rain storm on Thursday afternoon gave rise to conditions which makes it necessary for a full meeting of the Committee on Meeting to be held before announcement of results can be made.

A GROUP OF MEMBERS AND GUESTS ON THE CHALFONTE VERANDA STEPS

The committee will decide whether there will be a strict interpretation of the rule that in medal tournament play, a player is disqualified for stopping more than five minutes on account of rain. In the downpour and darkness of the thunder-squall late in the afternoon, several of the players sought shelter from the storm.

The annual base ball game between the two different teams of the Textile Base Ball Association was played Thursday afternoon at Inlet Park. The Reds and the Blues put up a better game than last year, indicating that the rumors of secret practice had not been altogether unfounded. The score of 16 to 14 in favor of the Blues shows that there was something doing in each of the five innings which were played. The game was called, not because of the exhaustion of the players, many of whom were good for one or two innings more, but on account of rain. The pitchers' reputation for speed and wonderful curves had preceded them and no one in the entire aggregation was willing to assume the catcher's job for either team. It was therefore necessary to engage special local talent of a dusky hue who were willing to undertake the task of stopping the balls even if they could not catch them.

The lineup was as follows:

BLUES	REDS
Slocum, cf.	Bryant, 3b.
Mumford, ss. p.	Davis, ss.
Richardson, 3b. p.	Mitchell, 2b.
Mackay, rf.	Hatch, 1b.
Marvin, 2b.	Steele, rf. capt.
Emerson, lf. p.	Bunker, cf.
Riley, p, 3b.	Burghardt, p.
Cooper, 1b, capt.	Havey, rf.
Glennon, rf. ss.	
Bones, c.	Tambo, c.

Some of the performers proved to be real

players and the adherents of each team were kept busy in applauding the hits and runs. Frank B. Kenney, who umpired the game, handed out justice with impartiality to both sides, at least to such an extent that there was no kicking and everybody was happy. The Blues win for the second time the honor of holding for the coming year the cup presented by Fibre and Fabric.

Besides the satisfaction of providing entertainment for their fellow members and enjoying the game for its own sake, each player this year received a substantial souvenir in the form of a silver clothes brush. The cup offered by L. T. Shurtleff of the Pairpoint Corporation, New Bedford, for the player having the best individual average was awarded to Thomas F. Glennon. In an aggregation of stars it was difficult to reach a decision, but Glennon's average on the total number of bases secured by his hits proved to be the best.

At the annual meeting of the Textile Base Ball Association R. N. Mackay was elected president for the coming year, Frank B. Kenney, vice-president, and F. L. Babcock, treasurer.

The captains for the teams chosen for the coming year were Thomas F. Glennon and John R. Mitchell.

NEW MEMBERS ELECTED

Active Membership

Daniel E. Douty, General Manager United States Conditioning & Testing Co., 340 Hudson St., New York City.

Alexis E. Lubchenco, Chief Expert on Cotton Culture, Agricultural Institute of Moscow, Agricultural Institute, Moscow, Russia.

Charles R. Marvin, Superintendent Lewiston Bleachery & Dye Works, Lewiston, Me.

Allan McNab, Jr., Treasurer The Draycott Mills and The Touraine Company, 60 Federal St., Boston, Mass.

Richardson P. Richardson, Assistant to Superintendent Empire Cotton Mills, P. O. Box 261, Welland, Ontario, Canada.

Charles L. Gilliland, Treasurer Aberfoyle Mfg. Co., Chester, Pa.

Associate Membership

Arthur C. Almy, President Arthur C. Almy Company, 89 State St., Room 30, Boston, Mass.

Harry L. Bailey, Wellington, Sears & Co., 93 Franklin St., Boston, Mass.

Joseph F. Cornwell, Cotton Broker, New Bedford, Mass.

William R. Davenport, Salesman Mason Machine Works, Oak St., Taunton, Mass.

Carl M. Hansen, Secretary Department of Accident Prevention, Workmen's Compensation Service Bureau, 80 Maiden Lane, New York, N. Y.

L. H. Kunhardt, Vice-President and Engineer Boston Manufacturers' Mutual Fire Insurance Co., 31 Milk St., Boston, Mass.

Ernest T. Manson, Head Representative Textile Dept., American Felt Co., 103 Bedford St., Boston, Mass.

MEMBERS AND GUESTS PRESENT

Connecticut

William H. Buckley, superintendent, Baltic Mills Co. and Mrs. Buckley.

Samuel T. Butterworth, superintendent, Lawton Mills Corporation, Plainfield.

Grosvenor Ely, treasurer, Ashland Cotton Co., Jewett City.

Delaware

Earl S. Jenckes, superintendent, Joseph Bancroft Sons & Co., and Mrs. Jenckes, Wilmington.

Georgia

John H. Hill, Atlanta.

W. R. B. Whittier, treasurer, Whittier Mills, Chattahoochee.

Illinois

Ralph E. McCausland, Barber-Colman Co., Rockford.

Maine

James E. Coburn, agent, Androscoggin Mills, and Mrs. Coburn, Lewiston.

Charles W. Dennett, Old Orchard.

Henry D. Lord, Saco-Lowell Co., Biddeford.

C. R. Marvin, Lewiston.

T. B. Stevenson, Augusta.

Massachusetts

Frank H. Burt, Boston.

Robert Burgess, general manager, Maverick Mills, and Mrs. Burgess, East Boston.

C. A. Chase, Boston.

F. H. Childs, Boston.

Melvin H. Coffin, Leigh & Butler, Boston.

James A. Cooper, Whitin Machine Works, and Mrs. Cooper, Whitinsville.

Thomas G. Cox, Mason Machine Works, Taunton.

Leonard W. Cronkhite, treasurer, Industrial Starch Co., Boston.

George A. Cutter, Cell Drier Machine Co., and Mrs. Cutter, Taunton.

Frederick A. Flather, treasurer, Boott Mills, Boston.

John P. Marston, Boston.

Luther G. Goodrich, Barber-Colman Co., Boston.

J. Fred Havey, Saco-Lowell Shops, and Mrs. Havey, Lowell.

James Carlton Howe, vice-president, Saco-Lowell Shops, Boston.

George P. Grant, Jr., treasurer, Grant Yarn Co., and Mrs. Grant, Fitchburg.

Edwin Farnham Greene, treasurer, Pacific Mills, and president, Lockwood, Greene & Co., Boston.
S. Harold Greene, treasurer, The Lawton Mills Corp., Boston.
Frank B. Kenney, T. C. Entwistle Co., and Mrs. Kenney, Lowell.
Nathaniel Kinsman, Jr., Choremi, Benachi & Co., Boston.
Henry G. Lord, Textile World Record, Boston.
Stephen C. Lowe, agent, John Hetherington & Sons, Ltd., Boston.
Henry Marsh, Richards, Atkinson & Haserick, Boston.
Fred W. Steele, agent, Fisher Manufacturing Co., Fisherville.
William G. Nichols, general agent, International Cotton Mills, Boston.
Frank L. Nagle, Textile World Record, Boston.
J. P. Smith, Fall River.
Arnold C. Gardner, treasurer, Manomet Mills, New Bedford.
Thomas F. Glennon, agent, Quissett Mill, and Mrs. Glennon, New Bedford.
William E. Hatch, president, New Bedford Textile School.
Franklin W. Hobbs, president, Arlington Mills, Boston.
Thomas Hopkinson, Hopkinson Dyeing & Textile Works, and Mrs. Hopkinson, Fall River.
F. C. Bryant, G. M. Parks Co., Fitchburg.
H. K. Jackson, Boston.
Frank B. Comins, treasurer, American Moistening Co., Boston.
Allen McNab, Jr., Lancaster Mills, Clinton.
Frederick B. Macy, treasurer, Soule Mills, New Bedford.
L. H. Kunhardt, Boston.
William Firth, president, American Moistening Co., Boston.
Elmer G. Childs, Bliss, Fabyan & Co., and Mrs. Childs, Boston.
Sidney B. Paine, General Electric Co., Boston.
Frederic W. Parks, G. M. Parks & Co., Fitchburg.
William R. Noone, Jos. Noone's Sons Co., Boston.
Charles J. O'Malley and Mrs. O'Malley, Boston.
Mrs. A. A. Entwistle, Lowell.
Miss L. M. Stevens, Lowell.
E. T. Manson, Boston.
G. D. Thayer, Crompton & Knowles Loom Works, Worcester.
R. N. Mackey, Stafford Co., Readville.
Frederick H. Bishop, general manager, Universal Winding Co., Mrs. and Miss Bishop, Boston.
Garrett D. Bowne, Jr., Westinghouse Electric & Manufacturing Co., Boston.
W. S. Pepperell, Hopedale.
James Lawrence, Jr., Boston.
Charles M. Mumford, Lockwood, Greene & Co., Newton Center, Mass.
Albert Walton, General Electric Co., and Mrs. Walton, Boston.
Albert H. Green, Lowell.
Lewis T. Shurtleff, Pairpoint Corporation, and Mrs. Shurtleff, New Bedford.
Charles P. Slocum, Corn Products Refining Co., and Mrs. Slocum, Boston.
Joseph J. Smith, William Firth, Boston.
George F. Steele, General Electric Co., Boston.
Wallace I. Stimpson, Draper Co., and Mrs. Stimpson, Hopedale.
James Strang, Saco-Lowell Shops, Boston.
Philip C. Sullivan, Metallic Drawing Roll Co., Indian Orchard.
C. J. H. Woodbury, secretary and treasurer, National Association of Cotton Manufacturers, and the Misses Alice P., Laura B., and Louise Woodbury, and Mrs. Woodbury.
E. Howard Bennett, Wool and Cotton Reporter, Boston.
E. T. Fowler, treasurer, Foster Machine Co., Westfield.
George W. Towne, and Mrs. Towne, North Andover.
Jerome T. Rutledge, agent, Army and Navy Cotton Duck Co., Wilkinsonville.
Robert S. Wallace, Fitchburg Yarn Co., Fitchburg.
E. E. Palmer, Boston.
G. E. Richardson, Boston.
Clinton H. Scovell, Boston.
Day Baker, General Vehicle Co.

New Hampshire

William H. Cadwell, agent, Jackson Co., and Mrs. Cadwell, Nashua.
M. F. Foster and Mrs. Foster, Milford.
Mrs. F. D. Bartlett and R. C. Bartlett, Milford.

New Jersey

W. B. Dill, Atlantic City.
William L. Lyall, treasurer, Brighton Mills, and Mrs. Lyall, Passaic.

New York

C. N. Burghardt, New York.
Theodore H. Price, New York.
G. M. MacNider, New York.
Alex. S. Whittam, New York.
George W. Neville, Stephen M. Weld & Co., and Weld & Neville, New York.
Franklin Van Winkle, New York.
Albert Greene Duncan, treasurer, Chicopee Manufacturing Co., and Harmony Mills Co., Cohoes.
Gordon Bunker, New York.
John R. Mitchell, president, Mitchell-Bissell Co., New York.
J. L. Kraus, New York.
Wm. McEnerney, New York.
Carl M. Hanson, New York.
V. E. Carroll, C. H. Clark, C. W. Fisher and S. H. Steele, Textile Manufacturers' Journal, New York.

North Carolina

Ceasar Cone, Greensboro.
Stuart W. Cramer and Mrs. Cramer, Charlotte.
Samuel F. Patterson, treasurer, Roanoke Mills Co., Roanoke Rapids.
A. W. Lattee, Charlotte.
R. M. Miller, Jr., president, Elizabeth Mills, Charlotte.
S. B. Tanner, president, Henrietta Mills, Caroleen.

C. B. Bryant, secretary and treasurer, American Cotton Manufacturers' Association, Charlotte.

Rhode Island

George C. Phillips, president, Textile-Finishing Machinery Co., Providence.
Chester W. Smith, Providence.
E. A. Rusden, general manager, Textile-Finishing Machinery Co., Providence.
Edward J. McCaughey, secretary, Home Bleach & Dye Works, Pawtucket.
Alexander S. West, U. S. Gutta Percha Paint Co., and Mrs. West, Providence.
J. Henry Thorpe, U. S. Bobbin & Shuttle Co., Providence.
W. H. Smith, treasurer, Cadoza Lace Co., and Mrs. Smith, Pawtucket.
Ezra Dixon, president, Dixon Lubricating Saddle Co., Bristol.
William Halliwell, agent, Lawton Spinning Co., and Mrs. Halliwell, Woonsocket.
Albert H. Goff, D. Goff & Son, and Mrs. Goff, Pawtucket.

Pennsylvania

Elmer L. Cuthbertson, Philadelphia.
Robert Krook, Philadelphia.
Roland Gerry, assistant general sales agent, Jones & Laughlin Steel Co., Pittsburgh.
Walter M. Hodson, Mallison Rope Works, Philadelphia.
Harry W. Butterworth, H. W. Butterworth & Sons Co., Philadelphia.
Geo. C. Hetzel, president, Geo. C. Hetzel Co., Chester.
Joseph R. Grundy, W. H. Grundy Co., Bristol.
Churchill Hungerford, president, Hungerford & Terry, Inc., Philadelphia.
Walter W. Sibson, Philadelphia Dyeing Machinery Co.
Martin P. Glynn, Cannon Mills, Philadelphia.
Carl A. Baer, Philadelphia.
Geo. B. Mitchell, Jones & Laughlin Steel Co., Pittsburgh.
Walter M. Hodson, Philadelphia.
Theodore F. Miller, Stead & Miller Co., Philadelphia.
Robert P. Smith, Smith, Drum & Co., Philadelphia.
Wm. T. Westerman and Howard T. Westerman, Ontario Spinning Co., Philadelphia.
John P. Wood, William Wood & Co., Philadelphia.
C. R. West and Mrs. West, Philadelphia.
J. C. Noble, Philadelphia.

South Carolina

Ellison A. Smyth, president, Pelzer Manufacturing Co., Greenville.
A. F. McKissick, president, Grendel Mills, Greenwood.

Vermont

Reuben A. Cooke, treasurer, Queen City Cotton Co., and Mrs. Cooke, Burlington.

England

Thomas Aspinwall, Bolton.

PRESIDENT'S ADDRESS

By EDWIN FARNHAM GREENE, President
Treasurer Pacific Mills, 70 Kilby St., Boston, Mass.

The textile industry has for some years been facing a very serious crisis in the way of tariff revision. The change in administration made this certain and we are now to enter a period of operation under the new condition.

I should like to consider at this time, very briefly, a few aspects of this situation. It is perhaps hardly fair to say that all of the business hesitation in the past few months has been due to the prospect of a change in the tariff, for the tight money market, wars and prospective wars abroad and at home, and the proposed monetary legislation in this country has contributed much to the curtailment in business in the way of restricted credits and general caution. However, it is fair to assume that in the textile business, where a very radical cut is to be made in duties on imports, the hesitation is due largely to such changes. Frankly, the best informed manufacturers do not feel that they know just what the effect will be. Naturally, they look with alarm on any such radical change as is being made, but possibly the high efficiency of our mills and the comparative proximity of the markets may enable us to compete successfully with the foreigner, but, in any event, it is certain that competition from abroad will be much keener and a very serious factor with which to reckon. If in spite of this competition we are able to operate successfully, and by that I mean continue to pay fair wages and earn a reasonable return on the capital invested and do so over a period of years, we cannot complain. What I fear most is that the worst will not come at once. The mills of Europe are as a whole fairly well employed, particularly in England on cotton goods, and it may be true that the American mills can continue to do business at a moderate profit in spite of increased importations, but when the business is depressed abroad the ad valorem tariff will fail to give the same protection as with high prices at the very time when the American mills need protection most. It is then that I fear trouble.

We are, however, an optimistic people and we should enter on the new era as cheerfully as can be, having full confidence that if in spite of our best efforts the new tariff proves an undue burden, the government in Washington will see its mistake and make reasonable changes. In the meantime, it behooves us to see that any just criticism of inefficiency cannot be laid at our door. We believe that the industry as a whole is highly efficient within the limits of American conditions.

Let me consider briefly comparative conditions here and abroad. The most important questions of wages I considered in my address in Boston last spring and will not attempt here to point out the fact that the wages paid in the textile industry are much higher here than our critics would have the public believe and, on the average, are twice as high as abroad. I think it is sufficiently clear also by this time that one of the most serious handicaps with the American mills is the first cost of a cotton or worsted mill, as it is nearly twice what it is abroad. This necessitates

twice as much capital, doubles the cost of repairs, insurance, depreciation, etc. This is due almost entirely to the high wages paid in this country, particularly to skilled laborers such as carpenters, masons and mechanics. Moreover, I have nothing to criticise in this respect except to ask the public to bear this fact in mind when forcing us into this keen competition with foreign mills. As can be clearly seen, it is not only a question of actual wages paid in the mills, but also the high wages, received by every American laborer, which enter into our problem.

The overhead expense of American mills is necessarily high. This is due in part to the fact that this is a large country and that mills are located at some distance from the market where the goods are sold or in which the raw material is bought. The very fact that the mills in this country are widely scattered is an item of expense which does not enter into the cost of production in England where the mills are located largely within a few miles of Manchester or Bradford. The higher cost of living in this country means higher salaries of clerks and officers and yet the relative expense is very moderate.

I had occasion not long ago to compare the expense of the executive office, or treasurer's office, of several New England mills, including the salaries of the officers, and I found that such expense averaged about one-half of one per cent. of the net sales. This does not seem an unreasonable amount. Moreover, those of us who are familiar with the conditions of the country know that the selling expense is very moderate as compared with the cost of selling other articles, although it is difficult to get at the exact cost of the distribution of cotton and woolen goods on account of the fact that necessarily to give wide distribution the goods must pass through two or three hands before reaching the ultimate consumer. The expense to a mill selling its product is very moderate. Many grey goods mills sell their production at a total cost of less than two per cent. on the sales.

It is perfectly true that a visitor to Lancashire sees a large business done at a minimum of expense, and I know the American cotton manufacturer is most eager to profit by this example, but it is only fair in judging of the results that we take into full consideration the conditions under which the business has to be done here in America.

Is it not reasonable to assume that an industry as highly competitive as the textile industry and established for nearly one hundred years would, through the very intensity of such competition, work out most of the economies that were possible? We are, however, only human and perhaps the very age of the industry may be a disadvantage. In any event, every effort will be made to carry forward the business just as economically as possible and to give the new tariff bill a fair trial.

In passing may I say a word on the question of scientific management. Any observant outsider can in a casual visit to our mills see ways of economizing, as they think, but those of us who have been in the business realize that there are complex conditions to contend with. I see no reason why the efficiency engineer has not just as much of a place in the industrial world as a lawyer or a mechanical engineer. We cannot allow either one to run our business. Undoubtedly helpful suggestions and criticisms can be made upon methods by men who have had a wide experience in various lines of industry and in different sections of the country. The trouble is that the profession is largely discredited by some who have gone into this work after making a failure of their own business. As I have pointed out, the textile industry is an old one, and possibly because of this very fact it is restricted by precedents and traditions of which we are not fully aware. A man therefore who has made a study of methods in the steel and electrical business, which have been the creation of recent years, may have some helpful suggestions for the cotton manufacturer.

Much as we may feel discouraged at the present moment, we have passed through hard times before and possibly the effect may not be as disastrous as some believe. In any event, we are going forward with courage, believing in the energy, ability and efficiency of the American manufacturer and laborer and in the fairness of the American people in the long run.

DEVELOPMENTS IN LUBRICATION WITH SPECIAL REFERENCE TO THE USE OF SOUTHERN CRUDES

By WILLIAM F. PARISH, Manager, Lubricating Division, The Texas Co., 17 Battery Pl., New York, N. Y.

The value of scientific observations in regard to the lubricating properties of mineral oils upon

WILLIAM F. PARISH

testing machines in the laboratories of our large technical schools is not open to question. These tests, when properly conducted and when the observations are rightly interpreted, lead to conclusions that can be of very great benefit to manufacturers in general. Outside of the laboratory, in

the average mill or shop, it is quite possible to secure results showing the actual frictional losses due to the use of various oils upon single machines or groups of machines, and these results, if the tests are controlled by careful, trained observers, will be of such a nature that reliable data will be secured in regard to the actual frictional effect with each set of lubricants tested. Quite naturally, inworking in the shop or mill under practical conditions, many factors influence these results. These factors are not, in nearly all cases, possible to control or eliminate; for instance, in cotton mill testing the influence exerted upon the power by the relative humidity and the temperature is very strong. This subject has been dealt with at considerable length in a paper I presented before this Association on April 25, 1906, published in Volume 80 of the Transactions.

In a laboratory where a single testing machine is under observation, all influences can be controlled and the results obtained on such a machine, operated under test conditions, have a considerable scientific value.

As to the general laws governing lubrication, these have been well established by such investigators as Dr. Thurston, Dr. Woodbury, Dr. Mabery, Dr. Holde and Dr. Engler. The rule is that within limits a reduction in the viscosity of a lubricant will bring about a reduction in the co-efficient of friction, or a reduction in temperature and in lost power. Most of the resistance or lost power in running machinery is caused by the internal friction or the fluid friction in the lubricant used, assuming that an average condition with an average oil is under consideration. It is only occasionally, through the use of a very improper oil or lack of feed of a proper oil, that actual metal wear on properly constructed bearings takes place. Wherever bearings are flooded, or where a proper working oil film is maintained, a very large proportion of the frictional loss is directly due to the internal, fluid friction of the oil itself, and this can be influenced one way or another along certain prescribed lines.

In my paper on the Economic Possibilities of Good Lubrication, Volume 84, of the Transactions of April 17, 1908, the results of twenty power tests were given. The average reduction in the total power of fifteen textile mills was 8.90 per cent., the lowest reduction being 2.50 per cent., and the highest 15.90 per cent. of the total load. The greatest proportion of this saving was due largely to the difference in viscosity between the different sets of oils tested.

In working entirely with Paraffine Base Oils, the co-efficient of friction, or the power factor, is influenced directly in proportion to the rise and fall of the viscosity of the oil used, always within the limits of speed and pressure. Working with oils made from the new Southern or Texas Asphaltic Base Crudes the same general rule also applies.

I have the honor now to present for the first time scientific and practical tests and investigations which show that, while the general law of the relation of viscosity to power is applicable to lubricants made from any one crude or classification of crude, a modification is necessary when tests on oils made from the Paraffine Base Crudes are compared with tests on oils made from the new Texas Base Crudes.

That is, while a lower power reading using Paraffine Base Oils can be obtained under certain conditions with a Paraffine Base Oil, of lower viscosity, the same lower reading can be obtained by using a higher viscosity Texas Asphaltic Base Oil. This technical feature of the Texas Base Oils is of the utmost importance, not only from a scientific, but from a practical standpoint.

These latter oils have been developed by a method employed by one of the most important refiners of that crude, and wherever these particular oils are necessary to be described in this paper, they will be referred to under the general trade name Texaco, with the name of the particular oil as a means of identification for any future investigators.

The following cases will indicate quite clearly the modification of the original established rule referred to above.

[Mr. Parish then describes several tests in technical detail.]

CONCLUSIONS

The series of tests described in case No. 1 are very conclusive. These experiments were made for the purpose of securing data which would show the effect of flow of oil upon the power—fortunately two sets of oils were used for the series of tests and these oils, undoubtedly unknown to the operators, were of widely different sources of origin. The facts established by the series of tests, combined with a knowledge of what the two oils were made from (which is indicated entirely from the gravity and temperature tests on each sample tested, low gravity with comparatively lower Flash, Fire asd Chill tests indicating the Asphaltic Base Oil), allowed the use of the data in showing scientifically the fact that a heavier Asphaltic Base Oil would produce a lower co-efficient of friction than a lighter Paraffine Base Oil. This is shown all through the five tests at different bearing pressures and rates of feed of the lubricant.

The results of case No. 2 prove that a lower temperature to the bearing is secured by use of a heavier Asphaltic Base Oil as compared to a lighter Paraffine Base Oil. The test also shows that the rule, that lowering the viscosity of an oil made from any one particular base will cause a lower temperature to be shown on the bearing under observation must be modified. This test is very interesting, as it shows the basic principal of the original rule of lubrication as well as the change in ideas that is required by the introduction of the new Southern Base Oil.

ADVANTAGES OF COMMERCIAL MOTOR CARS IN COTTON MANUFACTURE

Illustrated by Stereopticon

By DAY BAKER, District Manager, General Vehicle Company, Incorporated, 84 State St., Boston, Mass.

Somewhat over four years ago this Association, at Boston, listened with patience to my reading of a paper, which on request I prepared on The Mill Yard Transportation Problem.

At the time the first paper on mill yard transportation was presented in 1909, only a few of the

textile mills in the country had attempted the use of motor vehicles for their yard work, but since that time the introduction of motor trucks, especially those propelled by electric power, has increased in the Northern states with a steady, healthy growth.

This paper is illustrated with some of the mill and factory installations of motor vehicles in the New England States, in which section it is my privilege to know and meet many of the manufacturers. I am a great believer in illustrations. A few good photographs of motor vehicles performing in actual service seem to be far more convincing to the practical mill man than pages of well prepared arguments. Therefore, it is with pleasure that the illustrations are shown to give through your eyes the evidence to substantiate the claims which are made.

DAY BAKER

Not only are the problems of transportation encountered in handling the actual raw material, material in process, and the finished goods, but in the many contingent parts of mill work there also arises numerous calls for transportation of some character, which work can usually be much better done by motor vehicles than by any other method. As an example, it was recently arranged that an electric winch be applied to one of the yard trucks of a Lowell textile plant. With this electric winch freight cars will be pulled out of a freight shed where locomotives and gasoline driven vehicles are prohibited. This winch will also be used for loading heavy cases. The truck will as well be used for shifting freight cars around the loading platform. These are only a few of the many diversified uses to which an electric truck may be applied.

The bales of cotton or bags of wool and other raw material or general supplies, if not delivered by the railroad direct into the storehouse, must be carted there.

Perhaps it is then necessary to team it to the picker room, to start it on its long journey through the course of manufacture.

After being spun into yarn, it may be necessary to transfer it to a somewhat distant mill.

The goods being woven may have to be carted to the bleachery, the dye house or the finishing departments, and from these to other departments or to the storehouse, and perhaps later to the freight house.

Not every mill is so fortunate as to have its coal delivered from the railroad cars or boats direct to its coal sheds or boiler rooms, and therefore many mills are confronted with the additional problem of the transfer of coal from railroad lines and wharves to their own storage, and from there to their boiler rooms, many mills making two, and some, three transfers.

After the process of combustion, the remnant of the coal (the ashes) must be carted to such places as are being filled, or to the dump. Three of New England's large textile mills are making a profitable business of selling their ashes for sidewalk construction and filling purposes, making deliveries by motor trucks.

The material for shipping boxes does not come in on wings; it requires hauling to the carpenter shop and from there as boxes to the finishing room or shipping department.

The barrels of dye and bleaching materials will not roll themselves to the storehouse, and from there to the dye works or bleachery; they must be teamed, and their weight is such that they make heavy loads.

Lumber must be moved to the various places around the mill yard where repairs are going on, or if construction work is in progress, bricks, lime, cement, crushed stone and gravel must be carted.

These are some of the many problems that confront the superintendent of the mill or factory.

TWENTIETH CENTURY METHODS

We no longer weave by hand, nor do we travel by the stage coach, and as the world moves, so the conditions around the factories and mills change. Therefore, we should no longer cling to the use of brute force for the transfer of heavy weights. The lightning subdued by the brain of man, and harnessed by the generator and motor, now stands ready to do our bidding, better, quicker, cheaper, and without the unhygienic conditions which surround the stable and the horse.

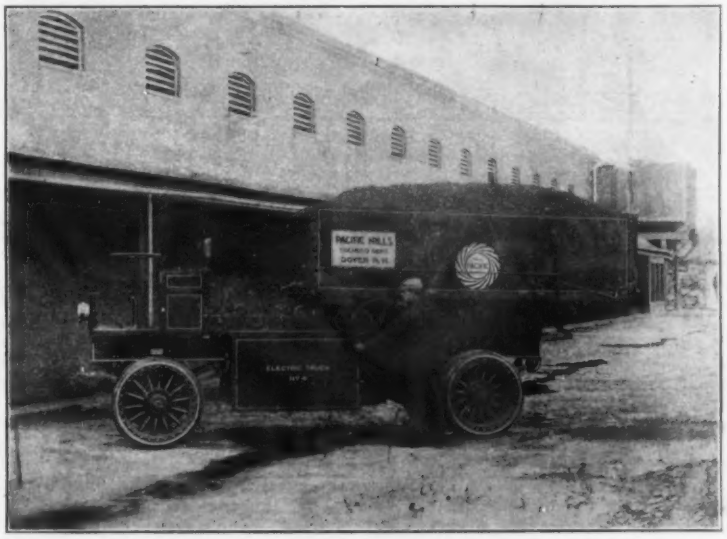
In order to avoid the fire risk entailed with steam locomotives, various experiments have been made in yard transportation, with compressed air. One of the experiments met with considerable success at the Plymouth Cordage Works, where small locomotives supplied with compressed air drew and shifted industrial cars. But this method was finally abandoned.

In some instances tracks and industrial cars, drawn by small steam locomotives, have been installed in the endeavor to better yard transportation, but the work of almost any mill is of such a varied character that the network of tracks required to reasonably cover the routes desired, the cost of laying them, and keeping in repair, more than offset their apparent saving. And then again, it is often desirable to use the mill yard vehicles around the town or city, outside of the

mill property on the public highways. This cannot be done if industrial rail cars are used. Therefore, trackless transportation in and around mills is really what is required.

ONE OF THE TWO-TON GENERAL VEHICLE ELECTRIC TRUCKS IN USE BY THE NASHUA MFG. CO., NASHUA, N. H.

In considering any method of transportation there are three things to examine: the road, the load and the vehicle. In trackless transportation the road must be accepted as it exists. In mill work the load must be accepted as it is received, and it must be delivered as ordered. These two factors of transportation are the same, no matter what method is employed. Hills, bad roads, frequent stops and starts, long routes or heavy loads are equal in the demand made on animals or machines of any kind. The third factor, the vehicle, is the only one with which the solution of transportation problems can be made any easier.



FIVE-TON DUMPING TRUCK, BUILT FOR COCHECO MILLS, DOVER, N. H

Just as the electric street car has solved the

problem for passenger transportation in cities, so has the electrically driven truck opened the way to a simple freight and delivery system around mill and factory yards, and towns and cities.

THE ELECTRIC VEHICLE

The electric vehicle for trucking and delivery is purely a mechanical proposition. It is a machine. Like other machines it can be built to do a given amount of work in a definite time at a certain cost under any known conditions.

The safely carried load in pounds or tons is the basis of its mechanical design and construction. The specified speed with full load on hard level determines how much power will be required. The specified duration of continuous operation at full load on a hard level determines the amount of energy that must be stored in its battery at one time. This last condition fixes the size of the storage battery. The power and speed required determine the size of the motor and the gear ratios, while the total weight affects the tire design.

The cost of transportation by electric vehicles can be determined just as logically as the cost of operation of any other machine. It is merely a question of measuring the work and measuring the cost and placing one against the other.

Accurate engineering can be applied to the problems of transportation with greater satisfaction with electric vehicles than any other type. Electrical measuring instruments reveal, and record, if necessary, the condition and performance of storage batteries and electric motors. The cost of producing electricity is a known quantity. The amount of electricity necessary to charge a battery is measurable. The amount of electricity delivered to an electric motor by the battery is a known quantity, or can be measured. The performance of an electric motor is accurately specified for any conditions. Its efficiency is easily determined.

The work of moving a ton a mile per hour on a hard level road is expended in starting it from rest and in overcoming the resistance of the road, the tires, the bearings, and electrical circuits and the air. If the road is not hard or not level, of course more work will be required to overcome its resistance, or to move the load up a grade. If it is necessary to start often from rest more work must be done than for continuous motion.

IMPROVEMENTS IN THE ELECTRIC VEHICLE

To get the cost of operation of its electric vehicles down to the lowest figure the General Vehicle Company has adopted methods that affect the design of the entire vehicle and result in an energy consumption per ton mile far below any previous figures.

TWO-TON GENERAL VEHICLE ELECTRIC TRUCKS IN USE BY MERRIMAC MFG. CO., LOWELL, MASS.

Simplicity has been one of the great factors in obtaining economy and reliability. By referring to the illustration entitled "Power Plant of General Vehicle Electric Truck" you will see that the entire motive machinery of the electric truck is simplicity itself. Four of the simplest forms of mechanism:

"A" a series wound motor, practically the same as in use on the thousands of street cars.

"B" a Morse silent chain, which in practice is covered from dust and mud by an aluminum case.

"C" an enclosed countershaft.

"D" standard roller chains.

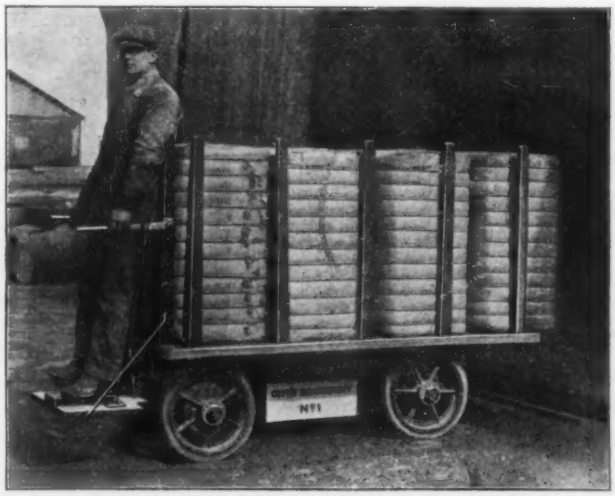
No gears to change; no clutch; no small parts to wear out or break on the road. No reciprocating parts. The power movement is all rotary. Any mechanic can readily see that with these few moving parts the road efficiency must be high, which, with the low cost of electricity and the low grade of help required to operate, makes a very economical vehicle from the owner's standpoint.

SELECTION OF ELECTRIC VEHICLES

The electric vehicle cannot be used profitably where it is not needed. Where the work to be done is less than half the ability of the machine, proper value may not be derived from the investment.

Where a large number of vehicles are used the advantages of electricity become more apparent and the efficiency of the service is still more improved.

Transportation by electric vehicles is a subject simple to explain and easy to demonstrate to the satisfaction of anyone interested. The selection of the proper equipment, however, depends on the engineering sense of one familiar with the problem.



ONE-TON GENERAL VEHICLE ELECTRIC INDUSTRIAL TRUCK HAULING FINISHED GOODS

TWO-TON TRUCK OPERATING IN A TEN-INCH FALL OF SNOW, AT PACIFIC MILL, LAWRENCE, MASS.

ELECTRIC VEHICLE ECONOMY

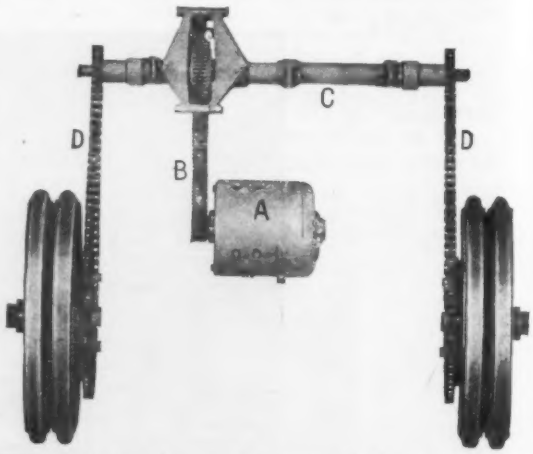
As most manufacturing companies are familiar with the horse drawn proposition, it is of interest to compare that method with the electric, there-

fore it may be stated that taking into consideration depreciation, interest, insurance, stable room, shoeing, veterinary charges, harnesses, blankets, stable help and feed, on the horse side of the argument, and the corresponding items against the electric truck, including electric power at four cents per kilowatt hour, the actual economy in cost sows in favor of the electric truck by 22 to 35 per cent., according to the size and number of vehicles operated, and the surrounding conditions.

It should be recollected that the electric vehicle requires only the space it occupies. It needs no hay-loft, stalls, harness room, bedding platform or manure pit; nor does it require extra equipment to do twice the work that horses drawing the same capacity per load accomplish.

While the stable man is obliged to keep a supply of extra horses to substitute for those which are sick, disabled, or being shod, it is not necessary to have extra motor vehicles on hand as 98 per cent. of all causes for delay can be provided for in advance and thus prevent or overcome lay-up for repairs.

In a small one-story garage, not over 25 by 60 feet, may be housed the complete equipment of five vehicles, which will displace and do the work of nine or ten horse-drawn trucks and eighteen to forty horses, according to the size of truck and the method of working horses. One intelligent mechanic and a helper can easily care for these machines and keep them in first-class operating order, while the drivers of the horses in a few days become proficient operators of electric trucks. Notice the economy in stable room and stable help.



POWER APPARATUS OF GENERAL VEHICLE ELECTRIC TRUCK

While the heat of summer, the chilling rains of the fall, and the low temperature of winter, to say nothing of the glare, icy pavements and deep snow, all work havoc with the health of the horse and make the death rate high, the electric truck knows no seasons, but keeps constantly at its work the year round, good and bad weather alike.

Accustomed as most horses are to moving freight trains and cars, it is nevertheless a fact that quite often a good horse will become frightened and run away, causing loss not only to vehicle, harness and load, but frequently irreparably injuring or killing itself or running mate.

TWO-TON ELECTRIC TRUCK ON A 12 4 PER CENT. GRADE AT MANCHESTER, N. H.

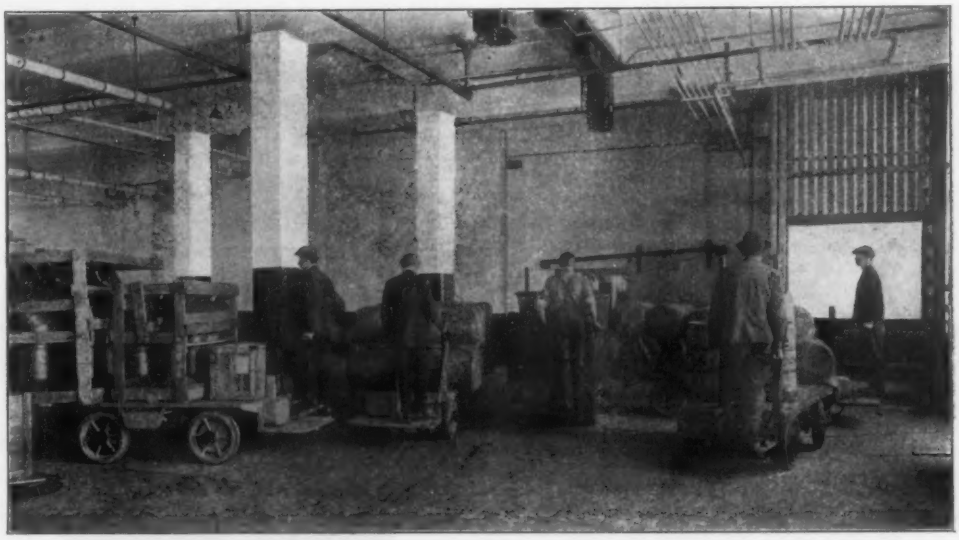
These incidents all go to make the horse expensive, and form links in the chain of strong arguments for the electric truck.

ARGUMENTS FAVORING ELECTRIC TRUCKS

Among the many arguments which should be considered in connection with electric motor vehicle work over horse drawn trucks are, first, the cleanliness in garage and around the yards. The vehicles and the motors driving them, running on very generously proportioned ball and roller bearings, which are sealed, oil and dust tight, require oiling only once in six months, and therefore have not the dirt and hot oil throwing proclivities incidental to other forms of motor vehicles. Second, the electric method is much cheaper, requiring a less number of vehicles, therefore less drivers, and the loading and unloading crews are less, or the present force is kept busier. Third, while the current for the charging of the batteries is figured in all commercial estimates on which this argument is based at four cents per kilowatt hour, it is a fact that most mills or factories can operate a small wheel or a small engine during the night, furnishing power to charge the batteries, or taking current from the lighting plant before the peak of the load, utilizing power which would otherwise go to waste, thus reducing the cost of current to a small fraction of a cent per kilowatt hour. Fourth, the flexibility in the handling, light or heavy loads carried with equal ease, the turning of vehicle and backing to freight cars, doors or elevators, and its ability, on account of occupying only 60 per cent. of the space used by the horse drawn vehicle, flexible steering, and starting and stopping devices, to travel in congested yards or buildings. Fifth, it can be run into factory buildings, on elevators, into shipping rooms or freight houses, and on docks and wharves, all of which places are barred to the gasoline truck by insurance regulations. Sixth, and most important, the money invested in electric motor vehicle transportation will produce a larger dividend, when compared with present horse costs, than is earned in any other portion of the manufacture of goods.

INTERIOR TRUCKING

With the advent of the electric motor truck for mill yard and road purposes has come a demand for a smaller form of electric truck to be used throughout mills and factories for the purposes of transporting raw materials, goods in process and finished goods through the buildings, and to assist in the loading of the outside vehicles.



FIVE OF A LARGE FLEET OF GENERAL VEHICLE TRUCKS, USED FOR TRANSPORTING PRINT CLOTH, DYE TUBS AND GENERAL FREIGHT AT PACIFIC MILLS, LAWRENCE, MASS.

THE INDUSTRIAL TRUCK

For a number of years the mill and factory men, as well as all freight and baggage terminal agents, have been looking for something to take the place of hand trucks. To meet this demand a simple form of electric vehicle has been designed in a small size, and is now in use in many mills, factories, depots, freight sheds, and on steamship piers. Its clearance and radius of action permits it to pass through congested places, going forward or backward with ease and facility, and capable of ascending gradients of 20 per cent. On piers and railway terminals it can deliver its load on the deck of a vessel or within a freight car. Those who travel by the Fall River Line may, on the pier at New York, see in operation over twenty-five of these little General Vehicle electric trucks. It will prove of interest to note the system of loading from a platform of the same height as the truck platform.

In a warehouse or mill the truck can carry its load from floor to floor, wherever wanted, with a degree of celerity otherwise impossible. In the mill and factory it carries materials direct to the place where needed, and at the precise time when

needed; something impossible with moving apparatus working on a fixed track. At the same time it does its work more quickly and far more economically than can be done with the use of hand trucks.

A load of 2,000 pounds has been found the limit for trucks to have the widest range of action.

GENERAL DESCRIPTION

The Industrial Truck illustrated is the simplest of all trucks electrically propelled, having from twenty to twenty-five less parts than usual. Both battery and driving mechanism are mounted below the platform, which accordingly is free and clear to carry not only a compact load, but iron pipe and similar material.

The operator drives the truck at three times the speed he would ordinarily walk when pushing or pulling a truck, and in addition is carrying two to three times the weight he would carry on the hand truck. He has perfect control over the truck, can steer it around corners or stop it instantly. Standing erect on the end of the truck with hand on the controller and foot on the brake pedal, he is in the best possible position to guide and control his load. As low grade labor is used for the operation of these trucks they must be made as nearly as possible automatic. Therefore it is mechanically arranged so that the controller returns to neutral point as soon as the hand is removed from the lever. The cut-off switch cuts off the power when the foot is removed from the brake pedal. The brake is spring-operated and sets instantly as the foot is removed from the brake pedal. It will thus be seen that should an operator jump or fall from the truck the mechanism will at once bring the truck to a standstill. In one of the large print works at Lawrence, Mass., a fleet of ten of these is used for carrying rolls of print cloth from the storehouse to the printing machines, and for the carrying of dye tubs from the color room to the machines, and the return of the empty tubs.

By the introduction of these small electric trucks it has been found that a saving in labor, sometimes reaching as high as 70 per cent., has been made. This means that the original cost of the truck is soon cared for from the labor appropriation, and the little machine is thereafter a great money earner.

Just as the electric light has supplanted the candle, kerosene oil and gas, and the electric car displaced the stage coach and horse car, so will the electric truck, one of the most useful inventions of the twentieth century, most surely succeed the slow going ox and the expensive horse.

Genius has entered the motor against the quadruped, and all who have witnessed the triumphs of the inventive mind over the clumsier resources of animal strength will realize that the horse must make way for the motor; for science and engineering skill are greater than brute force, and they have produced the electric truck, which is here today as a practical, economical machine.

METHODS OF COST AND CLEAR ACCOUNTING ESSENTIAL TO EFFICIENT MILL MANAGEMENT

By CLINTON H. SCOVELL, A. M., C. P. A.,
40 Central St., Boston, Mass.

Accounting serves a business in two general ways. It must necessarily record transactions with outsiders, customers and creditors, and, if it is a large corporation with many stockholders, there is a similar obligation to keep exact record of capital transactions. But an industrial enterprise that aspires to really modern management has just as much need for accounting and closely related production records on the internal aspects of the business. In the manufacture of textiles,

CLINTON H. SCOVELL

adequate internal accounting is of the utmost importance.

Many textile mills still have an accounting practice that operates on the principle of an old-fashioned "merchandise account;" that is, there is an inventory or stock-taking at the beginning of a fiscal period, purchases and operating costs are charged and the sales credited during the period, and only the taking of another inventory reveals in any conclusive or accurate way the profits which the business has earned.

By contrast with such a practice, modern industrial accounting records the transfer of values from an inventory of raw material, combined with labor and overhead expense or burden, through what is commonly called "work-in-process" to an inventory account for finishing goods, and finally to cost of sales; all with appropriate subdivisions, to make this kind of a record easy to keep, and as useful as possible to the operating officials of the mill.

In making an outline for the accounts of any

business, it is common to make a broad classification between balance sheet and loss and gain accounts. The balance sheet accounts are assets and liabilities (what the business owns and what it owes), and the loss and gain accounts are for income and expense (what ultimately the business receives and what it pays out). When all the assets are accurately stated, and all the liabilities, with a comparison of these various items from one period to another, the management sees clearly whether the mill has too large an investment in raw material, work in process, or finished goods. Business success depends among other things on a right relation with the capital investment, and therefore the amount that it is necessary or desirable to borrow, and not only does a reliable balance sheet serve as a guide to the management, but it will also be recognized more and more by the bankers as the only basis on which their customers may safely borrow, or on which the bankers in turn may safely lend.

ASSET ACCOUNTS SHOW HOW MUCH IS INVESTED IN THE BUSINESS

In the first place, the accounts should show definitely at all times what the proprietors have invested in the business. There should be asset accounts for land, buildings, equipment, raw material, work in process, and finished product; and the accounting should be in a form that will supply all the necessary information about the change in values of these various assets.

Many textile mills work on a wrong principle in handling their accounts for plant and equipment. In times of prosperity the values of the plant are written down, or important additions are made without any corresponding increase in the book values. This may be conservative, but it is wrong in principle and often bad policy, as many a management has learned when it became desirable to make a favorable showing of plant values in connection with the issue of new stocks or bonds. It is furthermore true that unless some accurate account is kept of plant values, the management does not know how much plant or equipment is devoted to a particular department and therefore what the real costs of manufacturing are.

On the other hand, if the business is not prosperous frequently no provision of any kind is made for depreciation, although it must be admitted that buildings and equipment deteriorate. They may be kept in repair, and for a long time they may be as efficient in use as a new plant, but the time will come when it will not be good policy to make any more repairs; either because the general deterioration has been so serious that repairs will not restore the original efficiency of the plant, or because it is no longer so well adapted to the business as a newer type of building or machine. Sometimes the plant has to be abandoned for a new location. In some industries there is a peculiar danger that equipment will become old-fashioned. In other cases the course of destruction is very rapid; but always, without exception, there should be an intelligent provision for depreciation.

HOW TO HANDLE DEPRECIATION

And just a word about the way in which to handle depreciation. It is altogether better that an asset account should start with the cost of the property, should be charged with all the additions and should be credited with the cost of anything that is actually sold or dismantled. At the same time there should be a charge against profits and a credit to one or more appropriate reserve accounts to take care of the deterioration which the asset necessarily undergoes.

Proper accounting for raw materials, work-in-process and finished product is sometimes a difficult matter, for it necessarily has the two elements of inventory values and manufacturing costs. If the industry is small and the product uniform, as, for example, a mill which recently came to our attention, in which the entire product was grain bags of one size and quality, the inventory requirements may be met very well by a thorough, honest stock-taking once a year, or once in six months, and the cost accounting by a practice which divides the value of material consumed, the total cost of labor and the total annual overhead expense by the number of bags produced, using the resulting quotients as the cost per bag for each of the three elements.

If the business is large, however, and the manufactured product diversified, made at varying costs, held as finished product varying lengths of time, and sold under differing conditions, this simple accounting is by no means adequate. Some plan should be in force to record the transfer of raw material, with labor and over-head expense, to the account which represents work in process, and a record should be made of the finished product which comes out of that account, and is either put into finished stock or charged directly to an account representing cost of sales.

It is apparent that we cannot go very far with asset or property accounts before we come in contact with the accounts which record the profit-making aspects of the business.

In addition to the assets which I have already described, there should be ledger accounts for cash, accounts receivable, investments (if there are any), and such items as prepaid taxes and insurance.

TWO CLASSES OF LIABILITIES

The other balance sheet accounts are for liabilities, divided into two classes, external liabilities such as accounts payable and notes payable, and those other accounts with credit balances, for reserves and for capital stock, which are sometimes regarded as the liability of the business to its owners.

ACCOUNTS NECESSARY TO SHOW THE EARNINGS

I regret to say that a good many prosperous and successful business houses do not maintain a standard of accounting practice such as I have described in respect to their assets and liabilities. Asset and liability accounts, however, they must have in some form, even if they are satisfied with far less than a reasonable standard of efficiency.

When they come to consider loss and gain accounts, I admit that accountants are frequently in despair at the omissions and makeshifts which they find in business offices. It is true that with a complete set of balance sheet accounts correctly made, the proprietors of any business know periodically what the net assets are over all liabilities; and it is furthermore true that if a balance sheet of a given date is compared with the corresponding figures of twelve months previous, and

allowance is made for the drawings of the partners, or dividends, in the interval, it is possible to derive an inclusive statement of what the business has earned. Accounts in this form may answer the requirements of a very simple business, but they are woefully inadequate for a business which has grown to any size, or which has any important diversity of product o make or sell.

THE MILL OWNER'S PROBLEM

The mill owner's problem reduced to its simplest terms is to make his product as economically as possible and to sell it at a profit. To do this he must first know the cost of manufacture as definitely as possible, which he will do by means of some kind of a cost system. It is a tedious and expensive undertaking to build and equip a new mill, and to complete the cycle of manufacture from design to finished cloth; and there is much to gain in the way of a clear understanding of textile costs, if we trace out this development step by step, taking careful note of the elements of the problems as we proceed.

ESTABLISHING A NEW INDUSTRY

When a new industry is to be established, the directors first buy a parcel of land suitable for the location of the proposed textile mill. If the purchase price is $100,000 the new enterprise has at once absorbed capital that should earn about $5,000 to the ordinary prudent investor, who takes no manufacturing or trading risks. A site as costly as this is probably situated in or near a city, so that it will be subject to taxes of $1,200 or $1,500.

Mill buildings are next erected at a cost, let us say, of $400,000 more. This outlay of capital, like the investment in land, involves an annual interest charge (of some $20,000), and under present laws, an annual penalty of some thousands of dollars more for taxes. But, unlike land, the buildings will require constant repairs; even then they are subject to a slow but certain deterioration and obsolescence that must be met as a charge for depreciation. To protect the investment, the owners must pay insurance and provide watchmen. To make the building usable, it must be heated and lighted, supplied with water and fresh air, and regularly cleaned. The striking thing about these charges is that they all go on without any abatement, unless the mill is shut down, dark and cold, and even then the principal charges—interest, taxes, insurance, repairs and depreciation—abate scarcely at all.

All of this expense has been incurred by the management to provide suitable areas for the intended manufacturing process. If there are five or six subdivisions, each one may make an entire small building, or all or part of a floor in a larger building. Whatever the details, each department (if we may use that overworked word) uses so many hundred square feet of floor space and must carry its proportionate share of the land and building charges already described.

MANUFACTURING BURDEN

Within a department there may be one or more production centers, corresponding to operations, such as carding, spinning, quilling, warping, or different groups of looms, if the mill has different sizes or different makes. The equipment in each production center represents an investment of capital; requires the payment of taxes and insurance; it suffers depreciation (even more rapid than the building), and it incurs charges for power, repairs, such indirect items as superintendence, inspection, and helpers' services. If the mill shuts down, the power may be shut off and the overseers and second hands dismissed; but so long as it runs, however short handed, or however inefficient, these charges do not change materially; and the fundamentals of interest, taxes, insurance, etc. (with the possible exception of repairs) are not not one whit less.

All that has been described so far is overhead expense, more properly termed burden, and does not include any labor applied directly to the product (like the operative who is dressing warps or tending a loom).

This great accumulation of burden represents manufacturing capacity. Each department, or if the calculation is carried to details, each dressing wheel or loom, has a known annual burden. Its cost per hour is determined by dividing the total burden by the hours in the working schedule, and the shorter the schedule, the greater the cost.

Having completed the buildings and installed the equipment, the management is ready to hire operatives and start the raw material through the mill. The fabrics are designed, the yarn spun or purchased, some of it is dyed, the warps are dressed, the filling is wound, the loom brings the warp and filling together, and the completed cloth goes through the finishing room, and perhaps the dye house, to the shipper. Throughout its course, the yarn and cloth have absorbed successive increments of direct or productive labor, and of the burden pertaining to the production centers through which they have passed.

WHAT CONSTITUTES AN ADEQUATE COST PRACTICE

An adequate cost accounting practice must follow the goods with as much precision as possible, accumulating data as the work-in-process moves from department to department, and concluding with a cost of finished cloth made up in detail of the costs of the successive operations through which the product has come.

The difficult part of cost accounting is to get a correct distribution and application of overhead expense or burden. Very few mills have calculated the burden element in cost with any degree of precision.

The distribution of burden to departments and its application to product as a percentage of direct labor is open to so many serious objections that it should never be used except for charges small in total and difficult to dispose of in any other way. Under some circumstances, a distribution of burden on the so-called "man-hour" basis is more satisfactory, but neither of these long-familiar methods are to be compared for accuracy and precision with a logical method of burden distribution which is based as nearly as possible on the actual facts of production.

CORRECT BURDEN DISTRIBUTION

A textile mill presents striking opportunities for the correct application of burden according to two

plans that meet this test in every way. Weaving labor, for example, is usually paid for at piece rates, and the corresponding burden, properly understood, is a rate for the loom, just as definite and just as easily charged to cost as the labor of weaving. A machine rate, correctly calculated, has the characteristics of a royalty charge, such as a shoe manufacturer pays on leased machinery. The analogy is remarkably close, except that the royalty does not include the expense incidental to space, power, or supervision. Anyone who has appreciated the simplicity and precision with which shoe manufacturing labor and burden costs are calculated (the material cost is far from simple) will understand the great advantages of getting a method equally simple and reliable for textiles.

Some textile processes, however, cannot be handled in this way. Dyeing, for example, is almost uniformly paid for as day labor. The employes often divide their time in too much detail to be made a matter of record; and the dyehouse burden, although clearly identified as belonging to this department, cannot be applied to the individual fabric any more easily than the dyehouse labor. Under such conditions the burden and labor are merged into "a process rate" charged to the manufactured product on the basis of unit costs.

This last example illustrates the fundamental importance of correct burden distribution, namely, that it identifies burden charges with the manufacturing process (carding, spinning, dyeing, warping, weaving, etc.), to which the space and equipment are devoted. Only when burden is distributed in this definite way to each department, or each operation, can a mill owner or executive know the real cost of successive steps of manufacture; and only when the costs are known step by step is it possible to speak with confidence of the total. Once the burden is located, it may be applied to the manufactured product either as a machine rate, or a process rate; or for the sake of simplicity, in dealing with unimportant totals, by older and less accurate methods.

In discussing various phases of industrial operations, the contrast is often drawn between cash, accounted for cent by cent, and material, labor, and burden disposed of with relatively little record, or none at all. When owners and managers understand that overhead charges or burden can be handled with something like the same degree of precision, they will not long remain content with "general expense" to be charged as part of costs by the means of some loose average.

MEASURING LOSS FROM IDLE EQUIPMENT

It is essential to distinguish clearly between losses or gains on fabrics actually made and sold, and losses due to slack production or inefficient use of equipment.

It must be borne in mind that the finished product of a textile mill has absorbed only the burden of the equipment actually used in its manufacture. It has not absorbed the burden of unused equipment or idle machinery. If the mill is equipped to do its own spinning, and the management decides to purchase yarn, the idle spinning frames have contributed nothing to the product. It is obviously unfair to charge into the cost of goods the burden charges on the dyeing department when the goods are not dyed. If the volume of dyed goods has dropped to nothing, certainly the white goods have not increased in cost. If only three-quarters of the looms run, the idle remainder have not helped make the pieces of cloth actually manufactured, and although the mill may go into bankruptcy if it cannot utilize its equipment, the cost of the fabrics actually made is not greater on that account.

The burden on idle machinery is no more a part of the cost of manufacture (unless due to enforced seasonal variations) than the burden on a mill owned by another corporation. When there is a proper distribution and application of expense burden, only the burden charged to cost which represents the equipment utilized in manufacture, and burden not applied remains as a balance to be charged direct to the loss and gain account at the end of a month, six months or a year.

If the distinction is maintained between losses or gains on goods made and sold, and losses due to restricted output, the management will consider sales policies in a much more certain way than is ever possible when the facts are obscured in the haze of average costs, calculated on varying volumes of product. In respect to burden it is frequently true that costs figured as averages vary beyond all hope of comparison as the volume of output goes up or down.

When a cost accounting practice is maintained that distinguishes carefully between prime costs for material and labor (which vary almost directly with the volume), and overhead charges or burden, the mill management can see exactly in times of slack production at what price they can take any line that is offered and get something to carry the burden of the mill, in addition to the direct cost of labor and material. This, it must be admitted, is to some extent a matter of policy, for a mill may decide to hold its price and restrict its output, rather than break the market by quoting prices that will give them temporarily a little additional profit.

Although textile mills are primarily industrial establishments in which the attention is fixed on manufacturing, good merchandising often plays an important part in the success of the business. It cannot be known positively what is good merchandising unless attention is given to such considerations as I have just named.

Whatever the effect on sales policy, good cost accounting, including correct burden distribution, is a matter of enduring importance from the point of view of manufacturing. Changes in volume may completely obscure gains or losses in efficiency, and render comparative costs of similar fabrics impossible from season to season, solely because of the variations in the amount of business done. Exact costs, comparable under all conditions, are not to be secured unless the burden charged to production is only that pertaining to the equipment that is actually at work.

Not only is it important that unearned burden should be carefully kept out of costs, but it is, in itself, a measure in dollars and cents of an im-

portant kind of inefficiency. For any management to know how much is lost in each department through idle machinery or wasted capacity may be more important than the exact knowledge of inclusive costs already discussed. It is another phase of that careful scrutiny of industrial efficiency so indispensable to successful management.

There is great virtue in any plan that not only permits but enforces a constant measuring of results. Perhaps the best illustration is found in the work of a salesman. Each day or each week shows results that may be compared with last week or with the work of some other salesman. Both employer and employe have something definite to reckon on as a return for the time and money expended. Manufacturing operations are just as much subject to a definite measure of results, if only the measure is applied in the right way. The emphasis should be on the efficient utilization of manufacturing resources,—labor, material and equipment. Good accounting is helpful to the sales policy of the business in two other important respects. Textile mills that are not making an absolutely standard product must plan selling campaigns in cooperation with the selling house, or on the advice of their own selling organization, with the idea that a product made at a calculated cost may be sold on prices and terms that may be forecasted with more or less accuracy. Under such conditions, it is of the utmost importance to remove all occasion for dispute between the mill and the selling organization as to the responsibility for the success or failure of such a plan, and what is more important, to fix definitely the responsibility for any failure that there may be to realize expectations. This highly important result may be secured by an accounting device which gives the mill definite credit for its own performance, credits the selling house for the net results of actual sales, and also charges against it any losses which result from a failure to realize nominal prices. Under some circumstances, this feature of a modern accounting practice may be the final step necessary to secure the harmonious and successful management which is the ideal in all business operations.

Proper methods of mill accounting, including an accurate calculation of costs, are of great benefit to the selling organization, in a way that is too little considered by most manufacturers. This is specially true of textiles generally sold under strictly competitive conditions, and on relatively small margins of profit. When the mill management has detailed costs, they can know the margin of profit between sales and manufacturing cost on each class or grade of product. The results will then be shown, not only as a total gain or loss on sales for the season, but as an analysis of operating results on which the management can select with certainty the more profitable products. Detailed costs are indispensable for accurate estimates on new lines of goods so that the management may avoid the mistake of taking on styles or lines that will not pay a profit.

Not only will a more exact knowledge of costs help a mill management to direct the attack of the selling force on the market, but when a mill is selling a variety of product at various margins of profit, it is not merely the amount that a salesman sells, but rather the amount of profit on his sales which is really important to his employers. This distinction becomes important in a large selling organization, and of course it cannot be made effectively except on a very exact and reliable knowledge of manufacturing costs.

As modern merchandising departs more and more from the tricky trading formerly the rule, the argument of a fair profit over a known cost will have greater and greater force. Even now a quotation may be sustained against competition as to price, by urging that customer cannot afford to buy at the lower price, and this argument is sure to count for more in the future.

It must be borne in mind that costs calculated as here described are inclusive costs. To sell at any margin above these figures is to make a real profit, in addition to fair interest on the investment, which is already included in the costs. The standard is set automatically. Every sale is above or below the point of profits.

A sales organization working under these conditions, although the individual men may themselves not know the cost, is sure to feel the inspiration of a task intelligently defined. A salesman who sells at a loss is always sorely discouraged in his salesmanship, whereas if he sells at a profit the success leads inevitably to warmer enthusiasm, greater activity, more sales and higher profits—with a resulting increase of salary or commission for himself as a reward. Knowing that the policy under which he works is scoring success day by day, he will talk the goods with more enthusiasm, and stand for the profitable price with greater confidence.

RELATION BETWEEN ACCOUNTING AND INDUSTRIAL ENGINEERING

Every manufacturer in this Association has heard a great deal in the past three or four years about industrial engineering and scientific management, and I think I may appropriately conclude this address with a brief statement as to the relation between accounting and these two kinds of professional effort.

Every business requires some kind of accounts and it necessarily gets some kind of management. Management may justly claim to be scientific if it gathers facts diligently, draws from these facts logical conclusions, and establishes principles and better details of practice for future guidance of the business. If we use the term in a technical sense, scientific management stands for a painstaking, detailed examination of working methods in industry, both men and equipment. In many cases this implies time studies and motion studies, and an examination of the reasonable working capacity of employes under proper conditions. Only those who have had experience in this work realize the important results that may be secured in industrial establishments if the owners and managers will only look at their own problems with an open mind. It is not necessary that the business should be approaching failure in order to have work of this kind highly profitable.

Along with these engineering studies there has been another kind of development from the pro-

fession of accountancy, of which the business world has heard comparatively little. Progressive American accountants are no longer content merely to audit their clients' books. Although auditing is a service which will always be of first-class importance, there is in most business enterprises an opportunity for a constructive service which has for its object the design and installation of better records and more significant accounts.

Adequate accounts will not only provide a management with information significant in the ways that I have indicated in this address, but when this information is made available in proper form for the directors and stockholders, they become to a large extent independent of any individual or group of individuals in the organization. The performance of executives is no longer a matter of assertion, and policies need not be determined by the persuasiveness of some individual with a convincing personality. When a board of directors has been accustomed to receive the significant facts, reported without personal bias or distortion, they can judge for themselves whether the mill executives are living up to their responsibilities.

And this matter, I think, is sometimes of even more importance to the executives themselves. If they are successful in their management, the accounts should be so arranged that this success will not be obscured by any circumstances of larger or smaller stocks, generous repairs or betterments charged against profits, or any one of the other petty irregularities that often obscure industrial accounts. Constructive accounting is the service which will provide just this kind of information for owners and executives.

Some aspects of this work are closely allied to the engineering work to which I have just referred, and many business enterprises need this kind of service more than they do the intense and exact study which is implied by a thorough-going application of scientific management. Scientific management is never complete unless there is developed, at the same time, accounting plans and a practice which shall adequately reflect for the management the net results of all the industrial endeavor. The combined service wisely applied to any business makes for stability and success.

THE PERMANENT FIREPROOFING OF COTTON GOODS

By PROF. WILLIAM HENRY PERKIN, University of Manchester, Manchester, England

The necessity of using for the construction of homes and other buildings, for their furnishings, and especially for clothing, materials which are readily combustible, has made the fire hazard one of the omnipresent problems of life and affairs from the earliest records; and in later days the application of chemistry to the process of permanently rendering such materials incombustible and resistant to fire is one of the problems whose interest has been only equalled by the difficulty of its accomplishment. I am submitting on this occasion the results of my researches on the subject, which were, for the most part, given in a general lecture before the Eighth International Congress of Applied Chemistry held at New York. The problem of the prevention of fire has always been one of the most pressing and at the same time one of the most difficult and perplexing with which mankind has had to deal. In very early times wooden houses caught fire and were burnt down and it is said that the Romans attempted to render wood fireproof by dipping it in a bath made of vinegar and powdered clay.

This treatment, so strongly reminiscent of processes employed many years afterwards, would no doubt be effective in rendering the wood less liable to inflame, but it can hardly have had wide

PROF. WILLIAM H. PERKIN

application because vinegar, in those days, was not easily obtained in quantity and was consequently an expensive substance. I have made a search in a number of old books with the object of discovering some other of the actual methods used in early times in connection with fireproofing and the first pamphlet on the subject which I have been able to find dates from 1638 when Nikolas Sabbattini published a remarkable paper in which he discussed the need of reform in the administration and construction of the theaters in Italy and pointed out the danger, which is always present, of fire breaking out on the stage, not only owing to the inflammable nature of the wood employed in the construction of the theater and for the decorations and scenery, but also on account of the inflammability of the cotton material used in the scenery and for the dresses of the players.

He recommends, as a safeguard, that the color used in painting the theater and scenery shall be mixed with clay and gypsum, but says nothing about the fireproofing of the dresses.

At a considerably later date—in 1735—Wild suggested a mixture of alum, borax and sulphuric acid for the same purpose and, in 1740, Fagot, in a paper read before the Academy in Stockholm, recommended a mixture of alum and green vitriol, whereas, in the Dictionaire de l'Industrie published in the year 1786, there is a paragraph in which it is stated that a mixture of alum, green vitriol and salt is effective in making wood and other materials fireproof.

After the disastrous fire in Munich on the fourteenth of January, 1823, which completely destroyed the Hof and National Theater, a large number of experiments were made, with the result that the wood used in the construction of the roof and other parts of the new theater was painted with several coats of sodium silicate and chalk.

A coating of this kind lasts for many years and, although it does not render the wood absolutely non-inflammable, it has at least this value that the incipient fire, which, as a rule, begins in quite a small way, meets with resistance at the outset, progresses but slowly and is easily extinguished.

At a somewhat later date, it was discovered that wood saturated with other salts, such as, for example, copper sulphate or ammonium phosphate, acquires the property of resisting flame, but of all the salts, zinc chloride seems to be the most efficient for this purpose.

In the first place, zinc chloride has great affinity for, and, therefore, attaches itself readily to, woody fiber, and fibers of all kinds and material saturated with a solution of this salt and then dried are practically non-inflammable. This salt has also this valuable property that it is a powerful antiseptic and therefore very suitable for fireproofing the wood used in the construction of hospitals and other public institutions of a similar nature.

But I do not propose to present to you at any length the subject of the fireproofing of wood and other building materials, a subject on which I have made comparatively few experiments and of which, I, therefore, have little practical knowledge.

What I wish to discuss, and I hope that the subject will prove interesting to you all, is the problem of the permanent fireproofing of wearing materials and especially of cotton and cotton goods, and by permanent fireproofing I mean protection which is not removed when the materials are subjected to the ordinary domestic wash.

Many disastrous accidents are on record which have been brought about by clothing catching fire: sometimes it is the case of a child whose garments have come in contact with a spark or lighted match and sometimes disasters of much greater magnitude have resulted from the ignition of costumes made of tow or other inflammable material on the occasion of charity entertainments or fancy dress balls.

It has long been recognized that impregnation with certain salts very much reduces and indeed may entirely destroy the liability of cotton goods to inflame and, of these fireproofing agents, I may perhaps be allowed to refer to a few only of the better known and more efficient. If a garment, after washing in the ordinary way, is rinsed in a solution containing alum or is starched with a starch containing a proportion of alum, the material, after drying, shows a marked reluctance to ignite, but this treatment has many drawbacks. In the first place it makes the material very dusty, and secondly, the fireproofing is only of a temporary nature since it is at once removed by contact with water and the process must therefore be repeated every time the goods are washed. I can easily demonstrate this and, in these and all my other experiments, I purposely take only very narrow strips in order that any smoke produced may not cause inconvenience in this hall. Another solution which has been strongly recommended for the same purpose is made up with 3 parts of ammonium phosphate, 2 parts of ammonium chloride and 1 part of ammonium sulphate in about 40 parts of water. If the material, after washing, is impregnated with this solution and dried, or if it is starched with starch made with the solution instead of with water, the dry material only ignites with difficulty, and, as it does not dust and is not prejudicially affected in any other way, this process has been used with advantage not only in connection with wearing material, but also for the fireproofing of lace curtains and other inflammable decorations. But in this case also, the fireproofing agents employed are all soluble in water and one washing is sufficient to remove them entirely, leaving the goods at least as inflammable as before. The process must therefore be repeated every time the goods are washed and this means expense which, in the long run, becomes considerable.

But a much more serious drawback to processes of this kind is the trouble they entail, since, in order to fireproof the garment, the washerwoman must have alongside the ordinary wash tub a second tub containing the fireproofing solution and this complication, added to the expense of the salts, has been shown to be so serious that processes of this kind are quite impracticable, especially in the homes of the poor. Again, unless the materials or garments, after washing, have been dried before immersion in the fireproofing solution, this solution cannot be kept uniform since, each garment being wet when put in, it leaves the solution weaker than before and therefore of less protective value. To dry each garment between the washing and the fireproofing entails so much trouble and labor and expense that it would obviously prevent any general adoption of the practice. Although the substances I have mentioned, and the salts of ammonium in particular, possess in a high degree the property of rendering material fireproof, there is one substance which confers the property of resisting fire to cotton goods in such a remarkable degree that it has long attracted attention and must be specially mentioned, and that is sodium tungstate.

A piece of muslin soaked in a weak solution of sodium tungstate and then dried is practically non-inflammable, but unfortunately this salt is again so excessively soluble in water that a mere rinsing in clean water is sufficient to remove it completely and the fireproofing is lost. And this applies not only to sodium tungstate but also to all the other salts which have, from time to time, been recommended for fireproofing purposes; the result is not permanent because the proofing is at

once removed when the goods are washed in the ordinary way.

The problem on which I was engaged for several years and which has now been successfully solved in a very simple manner, was that of attempting to discover some process which not only made the goods non-inflammable but also permanently non-inflammable, and the researches on this subject were originally started in connection with flannelette, a material very largely and widely used for clothing, especially by the poorer classes, and one of the most, if not the most, inflammable of all cotton goods.

Flannelette may be briefly described as a kind of calico the surface of one or both sides of which has been carded or raised into a nap, the result being that the surface of the calico becomes covered with a fluff of minute fibers somewhat resembling a thin layer of cotton wool. This effect is produced by subjecting the surface of the calico to the action of a series of revolving rollers covered with a vast number of small pieces of sharp steel wire, which tear up the surface, and the material is passed over these rollers over and over again until the required amount of nap has been raised. The result of this superficial covering of nap is—as everybody who has handled flannelette will know—a warm, pleasant and cosy feel and this is no doubt due to a covering of air being imprisoned by the minute fibers, thus producing a layer which acts as a non-conductor much in the same way as in the case of flannel.

Flannelette is indeed little, if at all, inferior to flannel as a non-conducting material and as it is very cheap and does not shrink in the wash, it has become very popular and is manufactured in enormous quantities and almost universally used for the clothing of children, especially in the homes of the poorer classes.

But it was not long before its increasing use showed unmistakably that it has one terrible drawback—the nap, which is its peculiar feature, makes it highly inflammable and much more so than the calico from which it was manufactured.

Flannelette is in fact, as I have already said, very much like calico on the surface of which a thin layer of cotton wool has been spread and this layer is, of course, highly inflammable.

The difference in the inflammability of calico and flannelette can be easily demonstrated by applying a light to strips of each, when it will be seen that while calico burns in the ordinary way, in the case of flannelette the flame flashes over the whole surface of the fluffy cotton layer and travels with extraordinary rapidity.

It is, of course, this property which makes flannelette one of the most dangerous of materials for clothing purposes. The alarming frequency of deaths by burning due to the wearing of flannelette became common knowledge, the coroners all over Great Britain repeatedly called attention to the matter and by degrees the agitation against its use for clothing became so persistent that the Coroners' Committee of the Home Office was directed to inquire into the matter.

The committee recognized that while, to quote the words of their report, "We think the common opinion attributing to it (flannelette) a large share of the blame (of burning accidents) is not far wrong," it was impossible to prohibit its use without causing great hardship, especially to the poor. Several years before this inquiry was held, one of the largest firms of flannelette manufacturers in Manchester, Messrs. Whipp Bros. and Tod, becoming alarmed at the frequent occurrence of fatal burning accidents and fearing lest these might lead to the prohibition of the sale of the material, came to me and asked whether I would undertake a series of experiments with the object of endeavoring to find a remedy for this state of things, and, after looking carefully into the matter, I consented to do what I could. That the problem was a difficult one from many points of view will be readily understood if I briefly state the conditions which had to be kept constantly in mind while the experiments were being carried on. A process to be successful must in the first place not damage the feel or durability of the cloth or cause it to go damp as so many chemicals do, and it must not make it dusty. It must not affect the colors or the design woven into the cloth or dyed or printed upon it; nothing (such as arsenic, antimony or lead) of a poisonous nature or in any way deleterious to the skin may be used and the fireproofing must be permanent, that is to say, it must not be removed, even in the case of a garment which may possibly be washed fifty times or more. Furthermore, in order that it may have a wide application, the process must be cheap. What was really to be aimed at was to treat the flannelette in such a way that it acquired practically the properties of wool, which, for all ordinary purposes, may be taken as the standard of a safe material. Apart from the other conditions which I have laid down, when one considers the vigor with which the ordinary washerwoman scrubs garments with soap, not infrequently with the assistance of the scrubbing brush, and takes into account the wonderful mechanical appliances now so largely used for washing clothes with the least expenditure of time, it will not be thought surprising that the discovery of a process of fireproofing sufficiently permanent to resist all these conditions seemed to me at first to be almost an impossibility.

Some idea of the difficulty of the subject will be gathered when I say that Samuel Bradbury, who so ably assisted me in the work and has kept a record of each experiment, tells me that upwards of 10,000 separate burning tests were made before the solution of the problem was reached. Besides these, a great number of further experiments have since been made to see whether an even cheaper process than that which has now been in commercial use for nearly ten years could be discovered.

I suppose that every one would agree that, at the outset of the experiments, the condition which seemed most difficult of realization was that of finding a substance which not only fireproofs, but which during the process becomes so permanently fixed that it will prove to be absolutely resistant to washing with soap and water or mechanical rubbing. Obviously the substance which is to fulfil these conditions must, in the first place, be insoluble in water and secondly, in order that it is not liable to be removed by mechanical rubbing and does not render the cloth

dusty, it must be fixed in the fiber and not be merely on the surface. [Prof. Perkins then describes various experiments leading up to the discovery of the perfected process.]

The matter was systematically followed up with the result that a process was gradually evolved which yielded material possessing quite remarkable properties. The process is briefly this:

The flannelette (or other material) is run through a solution of sodium stannate of approximately 45° Tw. in such a manner that it becomes thoroughly impregnated. It is then squeezed to remove the excess of the solution, passed over heated copper drums in order to thoroughly dry it, after which it is run through a solution of ammonium sulphate of about 15° Tw. and again squeezed and dried.

Apart from the precipitated stannic oxide, the material now contains sodium sulphate and this is removed by passage through water; the material is then dried and subjected to the ordinary processes of finishing. A long series of trials, carried out under the most stringent conditions, have conclusively proved that material subjected to this process is permanently fireproofed. No amount of washing with hot soap and water will remove the fireproofing agent, or in other words, the property of resisting flame lasts as long as the material itself lasts. I will demonstrate this by exhibiting four different specimens: (i) material as it leaves the process before washing, (ii) material which has been washed ten times by hand, (iii) material washed twenty times in a machine in a laundry and (iv) a portion of a garment which has been in actual use for two years, washed every week and is, as you see, in rags. This extraordinary property of resisting soap and water seems to me to indicate that the oxide of tin is not present merely as an insoluble precipitate in the cloth, but must have entered into some actual combination with the fiber, yielding a compound which is not broken down by the action of the weak alkali of the soap. But a matter of hardly less importance from the practical point of view is that the material is not only permanently fireproofed by the process I have just described, but it also retains and acquires properties which make it as perfect a material in all other respects as could be desired. In the first place the treatment has no effect on the delicate colors which are now so generally employed in connection with the manufacture of flannelette and other cotton goods and very careful experiments have demonstrated the fact that the insoluble tin compound in the fiber has not the slightest deleterious action on the most delicate skin. In addition, the presence of the tin compound in the pores gives the cloth a softer and fuller feel than that of the original flannelette and what perhaps is the most unexpected result is the fact that the material is considerably strengthened by the process.

A series of tests made by the Manchester Chamber of Commerce proved that the tensile strength of flannelette is increased nearly 20 per cent. as the result of the introduction of the tin compound into the fiber.

Further and very exhaustive tests made at the Municipal School of Technology, Manchester, on a machine specially designed for testing the wearing properties of fabrics, showed an even greater gain in durability in the case of fireproofed flannelette. These separate and independent tests conclusively showed that the increase in strength and durability was approximately equal to the cost of the fireproofing of the fireproofing treatment so that garments made from the permanently fireproofed flannelette are, as a matter of fact, no dearer than those made from ordinary flannelette and are at the same time as safe as if made from flannel.

This permanently fireproofed flannelette is now manufactured on a large scale by Messrs. Whipp Bros. & Tod in Manchester under the name of "Non-Flam" and, although its introduction has been slow, it is being increasingly used and will, in all probability, ultimately entirely replace the ordinary inflammable variety. One of the difficulties experienced in connection with its general introduction is the fact, that, owing to the high price of tin, which is now quoted at about £210 or $1.050 per ton, the cost of the process is not inconsiderable, but, even with tin at this high price, the extra cost is not more than 1 d. (2 cents) per yard or about 1 1/2 d. or 2 d. (3/4 cents) for a child's garments.

It is hardly necessary for me to say that this process can be applied to any cotton fabric and is especially valuable in connection with muslin because this material is so often used, especially on the stage, for dresses which, on account of their flimsy nature, are naturally highly inflammable. Of two strips of the same muslin, one of which has been treated by the "Non-Flam" process without in any way affecting its ordinary properties and was then washed ten times, the difference in inflammability of the two samples is very striking. While the centreated sample is highly dangerous, it is difficult to imagine that harm could come to any one who happened to be dressed in the treated material even if, by accident, a lighted match came in contact with the dress. Another direction in which the process may be used with great advantage is in connection with lace curtains. Many disastrous fires have occurred by reason of the ignition of lace curtains and there can be no doubt that the greater majority of these would have been avoided if the curtains had been treated by the "Non-Flam" process. As an example of this, if a strip of lace curtain which has been subjected to the process and then washed a number of times did accidentally come in contact with a lighted match, the danger of fire is reduced to a minimum because even supposing the material did catch fire, the flame is put out at once by the least shake.

It seems to me that it is obvious that, if this process or some other process capable of giving the same protection from fire was adopted in the case of all inflammable cotton goods and especially in the case of material used for garments, many disastrous fires and the appalling loss of life, especially among young children, might be avoided, and it is for this reason that I have ventured to bring the subject of the permanent fireproofing of cotton goods to your notice this afternoon.

THE NEW TARIFF AND FOREIGN COMPETITION

By WILLIAM WHITTAM, 32 Broadway, New York

The coming tariff revision will compel manufacturing and distributing economies drastic and far reaching in their nature. I speak only of the cotton trade, but my remarks will apply in a broad sense to most of our American industries. I shall show how long standing extravagances may be replaced by efficiency and economy, the fundamental requisites for success in world trade.

Cotton supplies nine-tenths of the world's clothing, of which outside our own country we furnish but a very small share of the finished article, but we supply the bulk of the raw material.

Our cotton manufacturers and merchants are generally liberal and sometimes lavish in their

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spendings to maintain and increase their home trade, because they find it pays. When such moneys have been judiciously put out, "selling expense" is a charge which has paid, and paid well since the business first started.

When it comes to foreign trade we are and have been slow, but shall soon be forced into a faster gait.

That we can become important factors in world trade is conclusively proven by Canadian statistics. Our trade with Canada has practically doubled in three years, and she is our best customer with the single exception of Great Britain. Our total exports to Canada (fiscal year ending 1913) amounted to $415,000,000, the year's gain being $86,000,000, and manufactures comprise about two-thirds of this immense total.

In three years our sales of cotton cloth to Canada have risen from $750,000 to $2,500,000, this in face of a 25 per cent. tariff preferential extended to England.

We are all wondering how the new tariff will affect us. Let us look at England, who is our greatest competitor abroad and who will under the new rates undoubtedly take away a goodly share of our home trade unless we better ourselves.

Examining the world's cotton trade from the Lancashire manufacturers' point of view discloses four striking features.

1. She is the creditor nation of the world.
2. She is the world purveyor of cottons.
3. She is the only important free trade country.
4. She does her buying selling and distributing more economically than any other nation.

It has always turned out, with a very few commendable exceptions, that when one advocates what has been demonstrated as a sound policy in our domestic market, as one equally suitable for foreign use, there is much head scratching and chin stroking. "The risk is too great" has been the common verdict hitherto,—a very erroneous one as our foreign friends and keenest competitors in other lands could tell us if they would.

They have satisfied themselves by a hundred and more years of experience that established terms of payment and other acknowledged trading conditions abroad are on the whole profitable. Else they would not fight as strenuously as they have done and are doing to maintain and to increase their existing turnover.

Abroad, there is an enormous field lying fallow so far as we are concerned, and a field which we must very soon systematically and scientifically cultivate if we are to avert a long and disastrous period of trade. The European is surely coming into our home market with the surety of a greater measure of success than ever before. Just as soon as the bars are let down and the entry made easier he will "make good."

This will result in forcing many of our mills altogether or nearly so out of the class of goods they are now making, into other lines already overcrowded; or the only other alternative will be to equip themselves to meet a new competition, keener than ever and under strange conditions.

Before coming to the question of economy in buying and selling, allow me to bring to your notice a superb sample of forehandedness on a gigantic scale.

Lancashire people have spent about $85,000,000 to benefit the city and the adjacent district on which so much of its well-being depends. They have built a ship canal reaching from the river Mersey, just above Liverpool; to force a reduction in the port charge of that place and to curb, —as they have effectually done—the old-time arrogance of its port authority.

We are perhaps more directly concerned with what the Lancashire manufacturer can save by using this short waterway for both his imports and exports.

I cannot do better than give the costs of two shipments of cotton, each covering 3,240 bales. That going by the Manchester Ship Canal showed a saving in transportation charges, as against the

like shipment via Liverpool, of $1,865.08, an economy not to be passed by at any time, but a most serious one in times of acute trade depression. There is also much to be gained in shipping Lancashire-made goods abroad by the Manchester all-water-route to anywhere, as will be seen when I tell you that on cotton piece goods sent to New York via Manchester Canal outlet, there is a saving of $1.80 per ton over Liverpool rates.

The sum and substance of the operation of the Manchester Ship Canal is that it forced a readjustment in a downward direction of previous Liverpool port charges. And this reduction, it has been conservatively computed, has brought about a yearly decrease to shippers within a radius of only twenty miles of Manchester amounting to no less a sum than $7,290,000.

What room have we in the American cotton manufacturing trade to talk about overhead, and what we have been wont to call irreducible fixed charges, when we place our own lack of united effort against such a magnificent example of united work for lasting common good?

In Manchester the major part of the business of the world's foreign cotton trade is done. The home trading house standing between the manufacturer and the retailer. While the so-called "Shipping" or export houses occupy the middleman's position in the export trade, many of these export houses are merely buying branches of large establishments abroad. Indeed there are several large American jobbing firms who have long had permanent branch buying offices in Manchester. Many of these foreign firms have very large warehouses and purchase goods for shipment to many countries. Others quite as important confine their operations to one or two countries. One important and outstanding feature is that one kind of fabric is often sold for markets widely separated from each other. Plainly this acts as an excellent balance wheel for the trade. For should there be a trade disturbance in one country, it is often compensated for by activity in another market far removed. This sort of a counterpoise is what we sadly need and can have only by securing a cheaper selling system, only possible by the concentration of buyers and sellers.

The Manchester Royal Exchange has a membership of over 10,000 and here practically the whole of England's immense home and export trade in cotton cloth and yarns is done. Every mill in that country is represented there and almost every foreign house of any importance is represented there directly or indirectly.

The buyer comes where he can secure the greatest selection, and keenest competition at the least cost to himself in money and effort. The yarn spinner sells and the weaver and knitter buy their yarns on the floor of the exchange.

Machinery makers, supply dealers, bleachers, dyers, finishers, yarn and cloth agents, merchants, foreign buyers, raw cotton importers and brokers, waste dealers, coal men, oil merchants, in fact, every business that has any direct connection with cotton, its manufacture, sale and distribution is represented.

One Manchester packing house has a capital of several million dollars, and there are many others with capital running well over a million. So far as the spinners and weavers are concerned, Manchester business is done on a cash basis, 2 1/2 per cent. fourteen days.

Another and important class of middlemen between the manufacturer and purchaser are known as "cloth agents," although the name does not properly describe their province. "Commission merchant" would better fit their business.

These agents make a sale, then buy from a weaver whenever possible at a price which will give them a profit. The weaver pays such agent 4 per cent., which includes all discounts and commission. Payment to be made the day the invoice is received. Some large concerns have a weekly "pay-day" on which all bills are paid, even such as are received up to the time of mailing the checks on the set pay-day. This is a real cash business. Out of the 4 per cent., the cloth agent must allow his customer 2 1/2 off fourteen days. Often also the agent is compelled to carry in his warehouse goods for which he has paid cash, waiting delivery instructions from his customer.

While the English manufacturer delivers his goods freight paid to Manchester, they are not packed, except in the case of goods to be retailed in the grey. When goods are shipped to a point carrying a higher freight rate than mill to Manchester, the difference is charged to the buyer.

Not 5 per cent. of English cotton spinners and weavers are directly engaged in the export trade. The exporter with his established connections,—often his own home house abroad,—or with his own corps of salesmen covering many countries, buys, ships and sells, leaving the manufacturer to attend to manufacturing. The exporter shoulders the long credits, and all the details which make an American manufacturer shudder when explained to him.

The Royal Exchange pays its proprietors well. Whenever any of its stock comes on the market, it realizes about twice its par value. In addition to the floor space for business, there are offices, stores, quarters for the Chamber of Commerce, and restaurants, all being revenue producers. There are nearly forty long distance telephones besides local instruments in the building, also a telegraph office and individual mail boxes for members.

An exchange in New York following the same lines would not only profit its owners; it would enormously reduce our present cost of both selling and buying without diminishing the net profits of our leaders in the present year. Our spinning and weaving costs are not too high to keep us out of foreign markets. Weaving labor cost counts rather more than half the labor cost from bale to cloth, and our weaving piece work prices are much below those paid in Lancashire mills.

An American textile exchange would work for our industry in two important directions. First, it would enable us to meet foreign competition with a stronger hand, and second, we should be able to conduct an aggressive campaign for foreign trade with a considerably better chance of securing a large measure of success. Our commission houses and other selling agencies would be just as requisite then as new, but their expenses would be very much reduced, while their opportunities for an enlarged trade would grow.

Industrial consolidation and centralization, including the buying and selling under one roof of everything that goes into or comes out of our mills, would bring about savings unthought of by most of us and considered impossible up to the consummation of such an undertaking.

The concentration of England's cotton industry in the county of Lancashire has been a great factor in its success. It is an advantage quite counterbalancing such things as proximity to the cotton fields, low taxation, hydro-electric power and other much talked-of superior conditions offered by the cotton belt as a cotton manufacturing era.

The task of starting such an exchange does not present any obstacles that cannot be got over. Our prejudices and long established trade usages must be subordinated to common sense and cast aside whenever they obstruct the path of progress.

With an exchange in New York, we should soon find not only foreign buyers attracted, but the big buyers from all jobbing houses would come to it, thereby reducing the existing great cost of having an army of men covering a continent. Indeed we would very soon have Manchester Exchange duplicated in usefulnness. If our present commission houses and mill corporations were to get together, and many of them subscribe from $1,000 each upwards, the amount required to form the foundation for a mortgage to erect such an exchange would soon be available.

Whether we like it or not, we shall be driven inexorably into the world's commercial struggle. We shall be forced to regard with the utmost care markets abroad and conditions at home.

Finally it is certain that any industry that practices divided effort and waste of time has no future, except at home and with protection high enough to offset a wasteful disorganization.

PRESERVATION OF LIFE IN FACTORY FIRES

By L. H. KUNHARDT, Vice-President and Engineer, Boston Manufacturers' Mutual Fire Insurance Co., 31 Milk St., Boston, Mass.

It would be as idle to assume that all these things were done for the safety of employes as it would be to assume that they were all done for the benefit of the manufacturer. Safety to employes goes hand in hand with safety and success to the business, and owners years ago came to recognize the fact that one cannot get along without the other, and progressive manufacturers have long endeavored to improve the conditions under which their employes work and live. In the ordinary large manufacturing plant, the investment per operative is often as much as $2,500 and for each one absent from work there is an economic loss and lessened efficiency throughout the plant, and in addition that part of the investment itself which the employe represents has, for the time being, lost its earning power and in addition there is a loss of wages to the employe. What is more essential, therefore, than that the safety of each employe be assured and his capacity maintained at all times! Any interference with the operation of a factory such as may occur by fire, results in consequential loss to all connected with it, and as a matter of self interest, it behooves manufacturers to care for the safety of their employes as well as of their mill buildings, and it is evident that what has accomplished one end has accomplished the other as well.

The financial consideration is, of course, prominently in the mind of a manufacturer, as he is constantly confronted with the necessity of keeping down expenses to meet keen competition. Consequently the saving of insurance premiums, together with the features above mentioned, all of which have to do with the financial success of the plant, have all contributed to the results accomplished and will furnish incentives for further progress.

It is not to be assumed that all factories are safe, for there are owners not sufficiently well informed or possibly not intelligent enough to appreciate that their profit depends upon safety.

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For these cases, legislation to require adherence to a proper standard is necessary, and I propose further on to outline what are the essentials of such a standard,—but right here care should be taken that this legislation is not unjust through ignorance of proper remedies, or does not go too far, or perhaps in the wrong direction, and thus become a burden or handicap to legitimate industry.

It is to be noted that recent fires, resulting in serious loss of life, have occurred in small factories and usually in those near the centers of cities where surroundings are more congested and the temptation has been to crowd too many persons into limited quarters not perhaps originally designed or intended to accommodate them. The larger factories and those more isolated from other exposures, as is usually the case in the industrial establishments of today which have done so much to promote the success and reputation of

this country, have given most serious consideration to the matter of self protection with the result that they have been almost entirely free from loss of life when fires occur.

As emphasizing this, I may state that the records of the Boston Manufacturers' Mutual Fire Insurance Company show that, since the beginning of Factory Mutual System in 1835, there have been but thirty-five lives lost in our factory fires, twenty-three of these being in an unsprinkled mill in Fall River in 1874 before the automatic sprinkler was developed and available for protection. Of the remaining twelve deaths (all occurred since 1874), three were killed by going back needlessly into the burning building, evidently to save personal effects at a cotton mill fire in 1907, and four were men of public fire departments killed in the performance of their duties at different mills. This leaves only five employes who were not able to save themselves in a period of thirty-nine years to date, and even including all, only a total of thirty-five deaths have occurred in seventy-eight years.

In factories covered by this record, all of which have fire protection and are of good construction, there are now employed 1,500,000 people, and there are in the homes dependent upon these at least 3,000,000 more, so that it may be said that there are now in these factories, or dependent upon them, 4,500,000 persons who are assured of almost absolute security of their own lives from fire, or the lives of those upon whom they are dependent,—this due to the safeguards provided by the owners.

Furthermore, our insurance, it must be recognized, does not cover all the industrial establishments equipped with adequate fire protection, as our standards have been accepted to a considerable extent elsewhere. In cotton mills, for example, covered by the policies under the Mutual Companies, there are about 450,000 employes, and in other cotton mills there are approximately 200,000 more. Practically all of these have the benefits of fire protection, as nearly every cotton mill in this country is today reasonably equipped with fire protective apparatus, including sprinklers. This proportion may be fairly assumed to apply to other manufacturing properties, and on this basis it may be stated that there are in manufacturing plants alone nearly 2,225,000 employes who are practically safe as regards fire, and there are certainly about 4,500,000 more dependent upon them. Thus there is a grand total of 6,725,000 persons in the United States and Canada who are enjoying the benefits of security of life from fire in factories.

Add to the above the fact that department stores, mercantile buildings, warehouses and similar structures in cities are improving their present construction in many cases and installing sprinklers and other fire apparatus, and that new buildings are being constantly erected in which the owners with full appreciation of the hazard of fires are insisting on the best construction and protection, and it will certainly be evident to the unprejudiced observer that tremendous strides are being made in preventing loss of life by fire. In these cases there is estimated to be at least an additional 250,000 persons working under sprinkler protection.

In modern protected department stores, moreover, let me call attention to the fact that, while the employes are safeguarded by the good construction and protection, there are daily many thousands of customers in these stores whose lives are made secure also.

Let me now enumerate the essential standards which have accomplished these results. In reality there are only two main groups.

First. Construction, which must be substantial, designed to prevent the rapid spread of fire and adapted to the occupancy intended and must take into consideration the chances of fires in certain processes and consequent hazards, as well as the number and location of employes accommodated in a given department.

Second. Private fire protection, or what may better be called self protection, which must include as a primary feature a properly installed sprinkler system throughout every part of a factory where there is anything combustible either in the construction of the building itself or in its occupancy.

To show that there is nothing new in this, let me again quote from the records of the Boston Manufacturers' Mutual Fire Insurance Company, which by vote of its directors in 1858, among other requirements, laid down the following for a cotton or woolen mill to be insured at the then lowest rate:

"Building to be brick or stone with solid walls. Roof, covered with metal or slate. Floors, plank with boards on top (the slow-burning type). Stairways in one or more projections of brick or stone. No openings in the floors from room to room. Elevators in the porch, or if inside to be closed by self-closing hatch. Force pumps and pipes from reservoir, hydrants. Fixed ladders and platforms at each story. Casks of water and pails each story. Boiler room outside of mill. Picker room outside of mill and connected by passageway of brick with fire doors. Room to have perforated pipe sprinklers with proper supply. Good watchmen's clock and half hourly records by watchman. Waste and dirt to be all removed from mill before shutting down each day, and mill to be kept in good order at all times. Building not to be near enough to any other to be endangered thereby."

Add to the above the requirements for the automatic sprinklers which was developed many years later and the value of which was immediately recognized, and we have what is today the foundation, as it was then, of good fire protection. Details have, of course, been perfected since, but I mention it all as showing that the manufacturers who developed and maintained the Mutual system were continually building up a standard for safety and were giving these matters thought far in advance of any laws relating to the subject, and it was necessary that they do this as a matter of self interest, even if for no other reason, for otherwise their property might itself have been destroyed by fire.

The prevention of such disasters as that at the Asch Building, New York, or at Newark, N. J., or at Binghampton, N. Y., has furthermore resulted in bringing our average fire loss in well protected property down to less than twenty-five dollars for each one hundred thousand dollars of

insurance and the actual cost of insurance itself down to less than five cents on each one hundred dollars. Surely this is conservation of our national resources in a most successful way, and it is fully comparable with the later efforts to conserve our natural resources to which so much time and study are being given.

In conclusion let me emphasize that the most vital factor in preventing loss of life and property is the automatic sprinkler and that this alone will render the great majority of fires harmless to life and of small damage to property, but there must, however, be secondary safeguards briefly covered by the general name "slow-burning construction," which means brick or equivalent walls, solid floors without openings between stories, stairs in outside towers, elevator and other openings protected, and safe arrangement of processes. Then, even if very rarely sprinklers fail for any cause, the spread of fire will be so retarded that the operatives can escape without harm. New legislation designed to prevent such awful catastrophes as that at Binghampton should therefore be shaped broadly in line with the safeguards developed by over seventy-five years of practical work in the large manufacturing properties of this country.

INDUSTRIAL ACCIDENTS, THEIR COMPENSATION AND PREVENTION

By CARL M. HANSEN, Secretary, Department of Accident Prevention, Workmen's Compensation Service Bureau, 80 Maiden Lane, New York, N. Y.

How largely the matter of industrial accidents enter into the cause of these, our social ills, I am not prepared to state definitely, but with a record of from 40,000 to 45,000 killed wage earners annually and with an additional 200,000,000 working days lost on account of non-fatal accidents among the rest of our working population, I made bold to opine that it constitutes one of the largest causes of poverty and consequent dependency. Translated into actual dollars and cents, taking the minimum of 40,000 killed at a value as producing members of society of $5,000 each, and $2 as an average wage of the non-fatally injured, we have the economic loss sustained to the nation as a whole on account of industrial accidents represented by the very munificent sum of $600,000,000 annually. This does not include all the indirect losses accruing in the form of restricted opportunities suffered by the dependents left by these killed and crippled wage earners. What that amounts to no man can calculate or estimate. I believe, though, we may safely put down our industrial accidents as one of the great causes of our social ills and as one of our greatest national wastes.

What have we done so far toward treating this problem scientifically? Very little indeed! We have been satisfied in most instances to delegate the treatment to political quacks, and have spurned the advice and counsel of men whose profession or business has made them experts on the subject. The result naturally has been in accordance with the treatment.

The politicians (I do not refer to the numerous earnest and honest officials charged with the administration of compensation and other insurance laws in the various states when I use that word—they are in duty bound to carry into effect the laws as enacted and are seldom responsible for the irresponsible bills introduced and passed)—the politicians, I repeat, of the I-am-in-it-for-all-I-can-get-out-of-it variety, and the any-means-to-an-end-as-long-as-I-am-provided-for type were unfortunately the ones who first grasped the importance of the subject, and noticing the rather indifferent attitude of employers and business men in general, they were not slow to grasp the opportunity and to endeavor to turn the whole agitation into political capital. In some instances, I am sorry to say, they have succeeded beyond their own expectation.

I cannot refrain from here referring to the fact that the governor of the state of New York,

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solely for political reasons, vetoed a compensation bill last spring. The bill in question was admittedly a good one; it had been endorsed by a majority of the industrial interests directly affected and it carried the stamp of approval of the superintendent of insurance of the state. Nevertheless, in spite of these facts, the governor vetoed it. And why? Simply because certain labor agitators posing as the friends of labor, but in reality their worst enemies, were backing a monopolistic state insurance fund bill along the lines of the Ohio act. They and others of their type wanted jobs, and as the bill as passed was primarily designed to provide compensation for injured workmen rather than to provide jobs for political parasites, they did not desire to see it made into law; and it evidently did not take long to convince the governor of the sovereign state of New York that he needed jobs in his business also.

Let me here state emphatically, gentlemen, compensation for industrial accidents inherently is not, never was and never should be permitted to

be made a political issue, and the sooner the employers, employes and the public at large realize this fact, the less there will be to rectify and undo in the future.

The political advocates of workmen's compensation laws having realized fully the bountiful harvest which will of necessity be reaped by them if they carry their ideas into effect, are persistent in associating such laws with a plan of state insurance. It is but natural that they should do so, because only if such a plan is adopted will the jobs and subsequent spoils accrue. We are told by these saviors of the country that the two are inseparable—that is, compensation laws and state insurance are dependent upon each other, when as a matter of fact they are not naturally related at all. We are further advised by these same gentlemen that other nations have found it necessary to adopt the socialistic program of state insurance in order effectively to carry out the intent of the laws. Now this is simply a plain misstatement of facts made deliberately, or I desire to believe, ignorantly. It may surprise some of you to learn that today, after thirty years of compensation insurance in other countries, less than 1 per cent. of total insurance carried is state insurance; and it is a further substantial fact that in all countries where the state has been put in competition with private institutions, it has signally failed in spite of unfair competition, in spite of undue advantages in the forms of exemption from taxes, from office expenses, and such other expenses as private carriers are called upon to meet out of their premium income, to make any inroads on the business of private carriers. State insurance has in plain words failed to "make good" and therefore stands condemned.

I am sure, gentlemen, if you will give the evidence against out-and-out state insurance or any form of quasi-state insurance, due consideration, you will come to the conclusion that it is impracticable. Furthermore, you will reach the conclusion that if politics has been able to exercise so detrimental an influence upon such a plan operated under the semi-military form of government in Germany, it needs no vivid imagination to picture what would be the result if a similar plan were adopted under our system of government.

As manufacturers it would seem to be to your interest to register an emphatic protest in any state where you are interested against any plan of compensation for work accidents carrying with it any system of state or semi-state insurance, compulsory or otherwise. And, gentlemen, if you truly believe in republican form of government and cherish democracy as opposed to bureaucracy, individualism as against socialism and paternalism, your protest must of necessity be still more emphatic. If you admit that the unprecedented intellectual, industrial and social development in this country is due to private enterprise, initiative, civic independence, freedom of thought, action and decision, your aversion to the expression "Monopolistic Compulsory State Insurance," with its inevitable "bureaucracy," must be positive and final, and you will demand that our governments, federal and state, confine their activities to the purposes of their establishment, namely, the protection of the rights accorded their citizens under the constitutions, and the consequent fostering, encouraging and regulating of our industries and commerce.

What I have said up to this point would be absolutely futile, unless it were followed up by some positive suggestion or recommendation. This I shall proceed to do, making bold to assume that my experience with and study of this subject qualifies me for so doing.

How is the burden of compensation for work accidents to be distributed? There is but one logical way—that is, through insurance. You cannot carry a probable loss into your production cost sheet. You can, however, insure that probable loss, and as far as you are personally concerned, the premium which you pay represents the amount to be distributed over your product, afterward to be reflected in the final purchase price at which your goods are sold to the consumer.

There ought, however, to be and there is more than one method by which you may be able to insure against the probable loss, and I shall briefly touch on all of them. They are:

"Self insurance, where the financial responsibility of the employer warrants it;

"Mutual insurance, under private management;

"Mutual insurance, under supervision of a state official; and

"Our long-adhered-to system of insurance through private stock companies."

In order to give the employer the widest possible latitude, and in order to attain the highest degree of efficiency, these four plans should be provided for, and as far as requirements are concerned, financially and otherwise, they should be put on an equal basis before the law. Only in this way can we truly determine the efficiency of each, and only in this manner can we have absolute guarantee of solvent insurance. If an employer desires to insure his own liability under a compensation law, he should be required to show and set aside sufficient assets to cover fully any probable losses. If he desires to insure in a mutual concern, whether private or managed by a state official, that mutual should be required to set aside reserves for reinsurance and for claims sufficient to meet all contingencies. If he adheres to our long established system of stock company insurance, he should have a guarantee to the effect that the assets of that company in paid-up capital and earned surplus are sufficient to fulfil obligations under the contract, and that he is amply protected as well by reinsurance and claim reserves.

I shall not enter into the merits or demerits of the four systems here mentioned. They all have their good points, and I believe there is room for all of them. We may have our individual ideas as to which system will ultimately predominate, but time only will verify them to a certainty.

The question as to what should be the amount of compensation is also open for serious consideration. We find in the various laws so far enacted that the benefits vary greatly. In this, you gentlemen and all other manufacturers are vitally interested, operating as you do in various states and competing with one another in the world's markets. If the compensation for accidents is higher in one state than another, it naturally places

at a disadvantage the manufacturer in that state. Therefore, without going into merits of what is a fair compensation, suffice it to say that the benefits under the various laws in the several states should be as nearly equal as possible. At any rate, I think that most of us will agree that for economic and sociologic reasons we should as soon as possible adopt the principle of compensation in all states, even though some inequalities may be in evidence at the beginning, and even though we know that the actual direct cost upon industries will be higher than they were under the negligence-liability system. The extra cost undoubtedly will be more than offset by the benefits which we as a nation will derive from the substitution, provided that the compensation principle is correctly applied and kept entirely clear of politics in the accepted sense of that word.

There is one more phase to this question and one which heretofore has been given but little thought, that is, what effect has all the litigation in the past had upon the far too strained relations between what we usually term capital and labor? I am given to believe it has had a very direct influence, and shall briefly refer to it in passing.

Let us picture a family bereft of its provider through an industrial accident occurring in a mill or other working establishment. The children are young, and what they are told and accept at that age usually remains indelibly impressed upon their minds for the rest of their natural lives. In this case, no funds are left for their sustenance. The accident is one for which no legal liability exists against the employer. The widow and her friends not understanding this, however, blame the employer for her and her children's misfortune. They bitterly denounce and attack the employer in the presence of these children as being responsible for their plight, with the result that the children grow up imbued with an innate hatred of the employing class, and furnish in time splendid recruits for our already over-stocked army of labor agitators of the vicious type.

On the other hand, under a just compensation system these dependents would at least not have starvation staring them in the face; and as payments will be made in most cases directly from the employer to the dependents, I believe the opposite effect upon children would be the result.

It is not my desire in making the above statement to create the impression upon you gentlemen that the compensation principle when universally adopted in this country will usher in the millennium as far as our labor troubles are concerned. I am in no sense that optimistic; but I believe that it will constitute at least one factor in bringing nearer together, and establishing more harmonious relations between capital and labor.

We have now left for consideration the most important phase of the entire problem,—that of raising to a higher standard of safety and sanitation the equipment and methods of operation in the various industries, thereby lowering the subsequent cost. How can this most effectively be done? Here I contend, and actual results substantiate the contention, that stock companies have in the past and always will excel all other methods of insurance in this country in their effort to encourage and educate the employer and his employes in that respect.

It is a trite but true saying that "the way to a man's heart is through his stomach." It may not be as trite but it is equally true to say that the way to the average business man's ear is through his pocketbook—by suggesting to him some plan or method which, when applied, will result in increased efficiency of his establishment and thereby, perforce, in larger earnings on capital invested.

If the plan suggested has in it the additional factor of an appeal to the humanitarian instinct inherent in all men and at the same time holds forth a promise to help ameliorate, as stated, the often too strained relations between him and his employes, the interest evinced by the average business man and manufacturer should be still greater. It was, therefore, early recognized by students and advocates of industrial accident prevention that to get the proper attention to which it was entitled, the economic advantages which accident prevention presented to the individual should be brought to the foreground.

RESULTS OF MOISTURE TEST ON AMERICAN COTTON AT THE HAVRE, FRANCE, CONDITIONING HOUSE

By D. E. DOUTY, Manager, United States Conditioning and Testing Company, 340 Hudson St., New York, N. Y

In a brief paper presented before the American Cotton Manufacturers' Association at the Washington meeting, April 9, 1913, I called attention to the variation of the humdity of the atmosphere during the principal months of the ginning season, July—January and the possible moisture content of raw cotton under those conditions.

The curves submitted were for the atmospheric humidity as reported by the United States Weather Bureau at Galveston, Texas, New Orleans, La., Charleston, S. C., and Mobile, Ala., and represent with a reasonable degree of accuracy the moisture condition at the principal points of shipment of cotton from these states. The data also represent quite well the condition throughout the respective states with the exception of inland and upland portions of Texas and South Carolina.

The first accurate information to be published upon the moisture content of a considerable quantity of raw cotton has recently been issued by the New Cotton Testing House, at Havre, France. The report covers the operations of the House from Sept. 20, 1912, to Jan. 9, 1913, and includes cotton direct from steamers and from storage.

The Havre Cotton Testing House was established in 1912 by the French Spinners' Association, 9 Rue Saint-Fracre-Paris, for the purpose of determining the moisture content of raw cotton and making such other tests as might be desired. All cotton received at the port of Havre must be sampled and tested by this laboratory before it will be accepted by any of the members of the French Spinners' Association.

The cotton is sampled at the piers or warehouses and the samples are transported to the Conditioning House in air-tight metal containers.

The bales sampled are 10 per cent. of the total number and may be selected by a representative of the Conditioning House or half each by the buyer and seller. A sample consists of from 700 to 800 grams (1.5 to 1.8 pounds) divided into two test samples. The charges for the tests are based upon the cost of the work and are moderate. The fee is 35 francs ($6.755) per 100 bales or 22.50 francs ($4.342) per 50 bales or less.

The French standard regain is 8 1/2 per cent. and the report of the testing house is based upon this standard.

Where cotton shows a less amount of moisture than this standard it is reported as gaining moisture in the test.

Where it shows a greater amount than the standard it is reported as losing. Each test lot usually represents samples from 50 or 100 bales and in a few cases a larger number.

The greatest gain in September, 2.065 per cent. steadily decreases until it reaches 0.690 per cent. in January; the mean value decreasing from 1.055 per cent. to 0.455 per cent.

There were no lots which showed a loss in September; from October the greatest loss, increases from 0.589 per cent. to 3.056 per cent., and the mean loss from 0.337 per cent. to 0.847 per cent. The mean total gain, 0.811 per cent., is slightly greater than the mean total loss, 0.753 per cent., showing that for Texas cotton in Havre the standard regain of 8 1/2 per cent. is about the proper value.

Of the New Orleans cotton only three lots, aggregating 250 bales, showed a gain, the average value being 0.562 per cent., while the mean loss increased from 1.319 per cent. in September to 2.324 per cent. in January, and the mean total loss was 2.112 per cent., corresponding to 10.6 per cent. regain from absolutely dry cotton. The least loss for the period was 0.366 per cent., and the greatest was 4.087 per cent.

One lot of Alabama cotton, 96 bales, showed a gain of 1.057 per cent., while the mean loss varied from 2.08 per cent. to 3.25 per cent. The least loss was 0.535 per cent., while the greatest loss was nearly 4 per cent.

No Georgia cotton showed a gain. The losses varied from the least at 0.889 per cent. to the greatest of at 5.018 per cent., with a mean total loss of 2.615 per cent.

Carolina cotton all showed losses ranging from the least at 2.423 per cent. to the greatest at 4.055 per cent., with a mean total of 3.354 per cent.

Of twenty-two lots consisting of 1,672 bales of American cotton from storage in Havre, upon which locality is not indicated, all but six lots, 355 bales showed loss. Those showing gain ranged from 0.550 per cent. to 1.591 per cent., with a mean total gain of 0.753 per cent. The losses ranged from 0.33 per cent. to 3.032 per cent. with a mean total loss of 1.8 per cent.

Comparison shows that the values obtained by the Havre Conditioning House confirm in a very interesting manner the possible values suggested in my paper on the value of "Accurate Testing in the Cotton Industry." The values are in general a little lower, but their fluctuations with season and from lot to lot confirm the predicted condition.

The summary in Table 2 gives the average gain and loss by localities, the number of bales, separated by gain and loss, and the approximate quantity computed on the assumption of 500 pounds per bale.

This shows that of the ten million pounds of American cotton tested, 5.5 million pounds contained less than the French standard 8 1/2 per cent. moisture, and 4.5 million pounds contained more than the standard amount.

TABLE II.—SUMMARY BY DISTRICTS, SEPT. 20th TO JAN. 9th

District.	Total Number of Bales.	Number of Bales.	Approximate Quantity Pounds.	Average Gain PerCent.	Average Loss PerCent
Texas, ...	10,987	10,047	5,023,500	0.811	
		1,850	925,000		0.753
New Orleans,	3,025	350	175,000	0.562	
		2,675	1,337,500		2.112
Alabama, ...	1,221	96	48,000	1.057	
		1,125	562,500		2.561
Georgia, ...	1,774				
		1,774	887,000		2.615
Carolina,....	350				
		350	175,000		3 354
From storage,	1,672	400	200,000	0.753	
		1,272	636,000		1.800

Table 3 shows the money value of this work. The gain and loss of moisture in pounds was calculated for each individual lot, and the value of the gain and loss to the French spinner was computed on the assumption of 17 cents per pound (85 francs per hundred pounds), as the average price of cotton in the Havre market during the last half of the year 1912.

TABLE III

District.	Weight of Cotton.	Moisture. Gain Pounds.	Moisture. Loss Pounds.	Value of Moisture at 17 Cents Per Pound. Gain.	Value of Moisture at 17 Cents Per Pound. Loss.
Texas, ...	5,023,500	35,662		$6,062.00	
	925,000		6,137		$1,043.00
New Orleans,	175,000	937		159 00	
	1,337,500		28,020		476.00
Alabama,....	48,000	507		86 00	
	562,500		14,006		238.00
Georgia,.....					
	887,000		21,573		3,667.00
Carolina, ...					
	175,000		586		99.00
From storage,	200,000	1,984		337.00	
	636,000		12,366		2,102.00
Total,.....	9,969,500	39,090	82,688	$6,644.00	$9,768.00

Value of excess moisture (loss, gain), $3,124.00.

Cost of tests based upon schedule of fees, $1,388.00.

Net cash gain to French spinners, $1,736.00.

The results as a whole illustrate admirably the fact for which I have long contended that the conditioning, i. e., the accurate determination of the dry weight of textile materials plus a standard moisture "regain," is not an operation having for its only purpose the prevention of fraudulent dealings and protection of the buyer against sharp practice of the seller.

It is just as important to the development of honest and intelligent business methods, the only methods which lead to continued and permanent success, that the seller whether he be a planter.

broker or banker should receive an allowance in settlement for accounts upon which he has furnished material below the average in moisture content, as it is that the buyer should receive an allowance for excessive moisture.

Industrial justice would award to the Texas grower or broker, the additional amount which he should have for his extra dry material just as it would exact from the seller of Georgia, Alabama or Carolina cotton a deduction for the excessive water contained in his material. The French spinners who purchased the dry Texas on conditioned weight suffered no loss by the allowance made necessary in the settlement. One hundred pounds, conditioned weight, of Georgia, Alabama or Carolina cotton will produce exactly the same amount of yarn as one hundred pounds, conditioned weight of Texas cotton of the same quality, i. e., there is the same amount of dry fiber in both.

Knowing that each pound of cotton he purchased, conditioned weight, would produce a definite amount of yarn no matter how much moisture it had previously contained, the spinner possesses a uniform standard upon which to judge the price offered and the cost of his product.

Materials which are bought and sold on conditioned weight have the uncertainty of moisture content completely eliminated and are entirely independent of the conditions under which they have been packed, transported or stored. The showing made by the Havre Conditioning House during its first three months would seem to completely justify its establishment.

SIZING FOR COTTON WARPS

By THOMAS ASPINALL, F. C. S., Lond., Analytical and Manufacturing Chemist, Bolton, Eng.

It is not necessary for me to explain to you the need to size yarns for weaving. You all know that it would be impossible to weave unsized yarn.

In different places various starches are used for sizing the same kinds of yarn. This is owing to varying ideas and opinions held in different districts.

Some managers have a very high opinion of the properties of farina, while others look askance at it, and will not touch it under any condition.

Others have a very high opinion of sago flour, while some hold the opinion that they cannot get a nice feel with it, and therefore will not touch it.

Some people swear by flour, and think that if anyone says they can size yarn without it that they know nothing about sizing.

When I began sizing I found that the English manufacturers had never thought of using maize (corn) starch; they thought they could not get good results from it. There are a lot of English manufacturers using maize starch now, and getting very good results.

I will give you an instance of this that came under my notice some time ago.

I went to give a demonstration of my method of sizing at a place where the principal thought that nothing but flour size would suit their kind of work. I asked him to get one sack of maize for a mixing, and he did. I made him one mixing and I went again the week following, and the cloth had got into the warehouse. He took me to see it, and he was so well satisfied that he told me he was arranging to buy sixty tons of the maize starch, and when I went the following week he had bought the sixty tons. The yarn did not lose any weight from being put on the beam to getting plated and put on the table in the warehouse. This completely upset all his previous convictions, as the yarn that he sized with flour never lost less than 10 per cent. This was on a pure sized yarn.

I went to see one of my clients who made a cloth for China, which is shipped in the grey, and

THOMAS ASPINALL

dyed by the natives. He had seen a Chinese merchant the week before and he said the cloth purchased from my clients came up after the dyeing with a sheeny appearance, and looked better than any other cloth he bought.

One of the properties of farina is that, on standing, it separates from the water and precipitates itself, thereby losing its adhesive properties. This change does not take place if it is well boiled.

I will now give you the origin of a few of the different starches.

Flour is the material from which wheat starch is extracted. The old method of making wheat starch is by fermenting the flour until all action ceases. This takes several weeks; then the fermented flour is allowed to stand quite still. This allows the starch granules to settle to the bottom of the vessel; on the surface of the starch a glutinous mass forms; this is mainly gluten and the fibrous matter that the flour contained. The liquor contains a soluble matter formed by fermentation, together with any salts that are soluble in an acid solution. This liquid is drawn off from the settled starch and residue of gluten, and the fibrous matter is scraped off. The vessel is again filled with

water, and the starch stirred into it and again allowed to settle, and this process is repeated until the starch is left pure. It is then taken out and dried, and becomes ready for marketing. In making starch by this process there is a large amount of waste.

In the first place, a very valuable nitrogenous food (which is the vegetable albumen or muscle-forming substance in flour, and forms 13 per cent. of the whole) is lost. By the old method of fermentation this is absolutely destroyed, and the amount of starch obtained by this process will not amount to 70 per cent., so that you see sizing by flour is an expensive process.

The up-to-date method of making wheat starch from flour is to knead out the gluten. This is done by placing the flour in a fine bag, and running a stream of water over it while it is being kneaded. This separates the starch from the gluten. The starch passes through the sides and leaves the gluten inside.

The gluten is then mixed with a percentage of flour and made into a dough, from which rich nitrogenous foods are made, such as macaroni, vermicelli, and such-like foods. By this process the by-product, which is wasted in the old method, becomes a valuable asset.

If an antiseptic is added to the beck when the flour is put to steep the gluten is not broken up, and you save a very valuable sizing ingredient, but this method of treating flour is for heavy sizing. I would not use flour for pure sizing.

Farina is the starch extracted from potatoes, and varies in quality more than any other starch, chiefly owing to the varying amounts of water which it contains. Unless you know the brand, you never know how it will work until you begin to use it. I will give you an illustration of this.

In one case I made a mixing of farina, taking 240 pounds, and making 200 Imperial gallons (240 United States Standard gallons) of size. This mixing put on 16s yarn 12 per cent. A short time after this I made another mixing of farina. In this mixing I used 336 pounds of farina, and made 400 Imperial gallons (480 United States Standard gallons) of size. This put 20 per cent. on 36s yarn; so you see that in the first a mixing of 1.20 pounds per Imperial gallon only put 12 per cent. on a coarse yarn; in the latter case, with 0.81 pounds per Imperial gallon, it put 20 per cent. on a comparatively fine yarn.

Sago is extracted from the pith of certain palms, which are cut down when the trunks have grown to about 20 feet high. They are then dried and cut into suitable lengths, then split, and the pith, which contains the starch granules, taken out. It is then broken up and ground, washed, and sifted, and when the starch granules are sufficiently washed from fibrous matter, it is dried and marketed. Sago contains a coloring matter which forms a very rich brown dye when treated with an alkali, and gives a tint very near the shade of Egyptian cotton when used for sizing American cotton.

Sago forms a very tenacious size, but if not sufficiently toned it gives a harsh feel to the cloth. In most cases this is not desirable, and can be obviated by proper toning or softening.

Mixings of sago and farina, or sago and maize, in varying proportions, give a very tenacious size, and also impart a better color to the cloth than when sized with sago alone. When cloth is made for bleaching, this is of no importance, but when sold in the grey, color is a very important matter.

Maize starch, as I said before, gives very good results, both as to feel and color.

I now come to the sizing of colored yarns. Some of these are sized in the hank, some in ball warps, some in the slashing frame. Sometimes it is necessary to size two or more colors at the same time, and put them on the same beam. In the latter case it is always best to use the starch that makes the most transparent size, and that which has the least action on colors. Under these conditions wheat, farina, and maize starches give the best results. They all form a colorless transparent mucilage, and this dries into a film that hides the coloring matter less than either flour or sago.

If flour size is used it would quite change the color of some of the dyes that are affected by an acid, as the flour, after being fermented, is always strongly acid.

I have seen some very good results obtained by dyeing with the size on the slashing frame. To obtain uniform results by the latter method, it is necessary to be accurate in every mixing, that is, as to weight and volumes.

For instance, if you make, say, 50 or 100 gallons in one mixing, you must make the same volume in every mixing. You should always take particular notice of the volume when the mixing is made. The same applies to weights.

In sizing hanks, or a solid-colored warp, you can always dye the size the same color as the yarn that you are sizing.

I find, on visiting various places, all sorts and conditions of plant for size making. In some places they have the same becks that they had forty or fifty years ago, and some of the makers adhere to the same ideas that prevailed in those days.

One of the ideas of the makers seem to be that a beck should under no condition be emptied, and they make it impossible to empty them by anything but a mop or a floor-cloth. Why this idea prevails I cannot make out. There ought to be an outlet in the bottom of every beck, boiler, and sow-box that is made, so that they may be emptied and washed out without any trouble in a few minutes.

I have mentioned this to a maker of becks, and he will fix them, and fix them any height from the floor and put outlets at the bottom of each beck so that any one can be washed in five minutes.

I will just draw your attention to one or two matters that crop up occasionally, viz.: Mildew, and trouble with bleaching, dyeing and finishing.

Flour size is the more liable to mildew than any of the starches. After being fermented it is always strongly acid, and an acid size assists mildew. This can be neutralized or rendered slightly alkaline when a mixing is made, and this will very greatly reduce the liability to mildew.

In 1902 I was called in to investigate a peculiar smell in some bleached cloth. It had a smell more like grey than bleached cloth. The bleacher called me in, and when he told me what he wanted I asked him to arrange for me to see the manu-

facturer who had made the cloth. He did so, and the manufacturer took me through his mill and showed me what he used, and he used nothing but sago and tallow.

When I examined the bleached cloth that had the peculiar smell I extracted a large amount of free fat, all saponifiable. This consisted of the added tallow and fatty matter from the cotton fiber, and this extract had the smell that was the cause of the complaint. The cloth from which grease was extracted had lost the smell.

I explained this to the bleacher, and advised him to have the cloth returned, and give it another boil with soda ash, and add a little soap to set up a quick saponification. He did so, and the cloth was quite right when it was finished again. Since this happened I have never used tallow for either sizing or finishing.

Two years ago I was called in to investigate another trouble with a cloth that sometimes finished all right, and sometimes came up wrong. This cloth was finished pure after bleaching, and was wanted with a firm bright finish. The pieces that came up right had a very nice sheeny appearance, and were quite firm. The pieces that came up wrong had the bright sheeny appearance, but were very soft and did not seem to have half as much body as the pieces that came up firm.

At first, when the complaints came, the soft pieces numbered about one in five hundred. This quantity kept on increasing until they got as many soft pieces as firm ones; then they began to come up all soft.

I found out what was the cause of the trouble. They got a man who was accustomed to tell how much size there was on by the feel. I saw a beam weighed, and asked what amount of yarn there was per cut, and when I calculated the amount of size on, I found it was 2.7 per cent. I do not know what friction this had to stand in the loom, but you all know that it would not stand much. I made them a mixing the same afternoon, but I told them not to use any of this until the morning following, but to run with their own size all that day.

They were just starting to run a set of 44s, to be put into a 79 reed, and they ran one beam and then shut down for the day. I was there the next morning before they started, together with the managing director, whom I had told what I found. I felt at the yarn on the beam that had been run the day before, and it felt to have nothing on, and when we weighed it there was barely 2 per cent. of size. Now how do you think that would weave in a 79 reed and about as many picks. I asked the man to show me how much grease he put on his sow-box when he stopped for the night to prevent skinning. He got a small shovel, such as is used for putting coal on a washing boiler fire, and he took a slice of the grease, such as he used, being the length of the shovel and handle, or about 5 inches broad and 2 1/2 inches thick, probably three or four pounds. The first cut run in the morning would skim this off. That accounted for the one in 500

I took a sample of the size that put 2 per cent. on 44s and it remained fluid when it was cold and all the grease was on the top.

When I went into the weaving shed, I found every part under the looms covered with a layer of cotton fiber from one to three inches thick. This state of affairs would not conduce to efficient production, nor would it increase the body in the finished cloth after bleaching.

I have been called in several times during this year to examine patterns of cloth that had been sent out grey, and dyed indigo by the natives of Egypt. The complaints were that the cloth would not take the dye, owing to something in the size. The people in Egypt seemed to have found out that if they said the cloth would not take the dye they would get some money, and the people who first called me in, had already paid £300. In every pattern I examined I found that the warps had taken the dye better than the weft. I need not tell you that these people have not paid any more claims.

At the beginning of this year I placed a new compound on the market for heavy size, and it has turned out very successful. This compound is to recover the elasticity in yarn which has been overdried. It takes several days to dry ten grams on a water bath, and in a week after drying, it had regained 88 per cent. of its weight, and this in the dry atmosphere of my office. I have registered this compound under the name of Steroline. I use another kind of Steroline for pure size. They are both antiseptic.

I send a large quantity of Steroline for pure size to Russia, and the people who use it use less healds than any other firm in the country, and the heald makers will not believe that they are not buying healds in England.

Two years ago I was called in to investigate the cause of healds becoming what the manufacturer called rotten. I found that one end of the eyes broke quite readily, every other part of the heald being quite strong. When I magnified the healds I could see deep grooves in the eyes, and this was where the threads broke. This was from a new set of healds, and the first beam had not been run off when this happened. These people did not know how to size yarn. They are now making a cloth as nice as any that goes to Manchester. I called to see another of my clients and I asked him how long his healds lasted and he said he did not know, but he had not bought any for eighteen months.

At the beginning of this year I had a portion of heald sent to me from India. It was grooved in the eye like the one I saw in England. The maker said there was something in the size that was rotting the healds, and the manufacturers said that the healds were not made as good as formerly, and each blamed the other.

I extracted the varnish from the thread and found that the original thread had sixteen strands and the so-called rotten parts had only two and three strands that were not cut through. These healds had been used in a loom making a cloth with 60 per cent. of size on the warp.

I saw a client of mine who made a cloth with 66 per cent. of size on 28s warp, and asked him how much yarn he could get through a set of healds when making this cloth. He said he got 1,800 yards through with 56 picks to the inch.

At the first place I made a mixing for pure size; previously, they always put two beams into a

set of healds, and the last time they mentioned their healds to me they said they had put eight beams into a set of healds.

There is also another matter to take into consideration, and the most important of all. It is production. If the production goes down, or if it is not at the highest point of efficiency, you are losing more than the whole cost of the sizing, and anyone who looks at saving a few shillings a mixing, and is not on the best lines, will lose perhaps one hundred times more than he will save by cutting down the cost of his mixings.

I will give you a few mixings in use by some of my clients:

Mixing, No. 1:
140 lbs. Farina.
80 lbs. Maize Starch.
60 lbs. Clay.
10 lbs. Mucilin.
15 lbs. M. 3.
10 lbs. Steroline (pure).

Volume when made: 264 United States Standard gallons.

This mixing put 13 1/2 per cent. on 28s.

Cost of 1 lb. dry size in above mixing equals 1.25 penny.

Cost of sizing 1 lb. of yarn with 13 1/2 per cent. equals 0.17 penny.

Mixing, No. 2:
140 lbs. Maize Starch.
100 lbs. Sago.
10 lbs. Mucilin.
20 lbs. M. 3.
10 lbs. Steroline (pure).

Volume when made: 240 United States Standard gallons.

This mixing put 15 per cent. on 60s.

Cost of 1 lb. of dry size equals 1.46 penny.

Cost of sizing 1 lb. of yarn with 15 per cent. equals 0.22 penny.

Mixing, No. 3:
50 lbs. Farina.
50 lbs. Maize Starch.
50 lbs. Sago.
7 lbs. Mucilin.
15 lbs. M. 3.
10 lbs. Steroline (pure).

Volume when made: 156 United States Standard gallons.

This mixing put 20 per cent. on 60s.

Cost of 1 lb. of dry size equals twopence.

Cost of sizing 1 lb. of yarn with 20 per cent. equals 0.40 penny.

MIXINGS FOR DRY CLIMATES

Mixing, No. 4, for 10 per cent. on 30s:
224 lbs. Maize Starch.
7 lbs. Mucilin.
10 lbs. M. 3 finish.
10 lbs. Steroline (pure).

Volume when made: 300 United States Standard gallons.

Cost of 1 lb. of dry size in above mixing equals 1.41 penny.

Cost of sizing 1 lb. of yarn with 10 per cent. equals 0.14 penny.

Mixing, No. 5, for 20 per cent. on 30s:
224 lbs. Maize Starch.
224 lbs. Clay.
10 lbs. Mucilin.
15 lbs. M. 3.
24 lbs. Steroline (pure).

Volume when made: 360 United States Standard gallons.

Cost of 1 lb. dry size in above mixing equals 0.9 penny.

Cost of sizing 1 lb. of yarn with 20 per cent. equals 0.18 penny.

Mixing, No. 6, for 30 per cent.:
224 lbs. Maize Starch.
224 lbs. Clay.
40 lbs. Mucilin.
30 lbs. Steroline (heavy).
7.2 U. S. gals. Mag. Chloride at 56° Tw.
3.6 U. S. gals. Zinc Chloride at 100° Tw.

Volume when made: 300 United States Standard gallons.

Cost of 1 lb. dry size in above equals 0.99 penny.

Cost of sizing 1 lb. of yarn with 30 per cent. equals 0.26 penny.

Mixing, No. 7, for 45 per cent.:
224 lbs. Maize Starch.
448 lbs. Clay.
70 lbs. Mucilin.
40 lbs. Steroline (heavy).
14.4 U. S. gals. Mag. Chloride at 56° Tw.
7.2 U. S. gals. Zinc Chloride at 100° Tw.

Volume when made: 330 United States Standard gallons.

Cost of 1 lb. of dry size in above equals 0.88 penny.

Cost of sizing 1 lb. of yarn with 45 per cent. equals 0.396 penny.

Mixing, No. 8, for 60 per cent.:
224 lbs. Maize Starch.
672 lbs. Clay.
90 lbs. Mucilin.
50 lbs. Steroline.
19.2 U. S. gals. Mag. Chloride at 56° Tw.
9.6 U. S. gals. Zinc Chloride at 100° Tw.

Volume when made: 396 United States Standard gallons.

Cost of 1 lb. of dry size in above equals 0.79 penny.

Cost of sizing 1 lb. of yarn with 60 per cent. equals 0.47 penny.

I will give you particulars of variations that may come through not attending to proper boiling and finishing at different volumes.

The weights sometimes varied at these two places, so I went over to investigate them.

The first place was where they used all sago. When I got there they were getting 12 1/2 per cent. on, and this was coming off very freely, so they made a mixing while I was there. I saw this mixing properly made, and with the same ingredients and the same volume made it put 15 per cent. on instead of 12 1/2 per cent., and this stayed on, at the other place they used 108 pounds sago and 20 pounds farina. They got all sorts of weights. This came about through finishing at different depths, so that they were making any number of volumes with the same weights of materials.

PURCHASING COAL UNDER SPECIFICATIONS

By GEORGE S. POPE, Engineer in Charge of Government Fuel Inspection, Bureau of Mines, Washington, D. C.
By Permission of the Director of the Bureau of Mines

Coal is burned under boilers for producing power, for drying various materials, or for warming buildings. The most valuable coal, therefore, is that which gives up the most heat to the boiler for a given weight burned. In purchasing coal then for any power plant the aim should be to obtain a fuel which, all things considered (such as equipment, price of coal, and cost of labor and repairs), will produce a horse power for the least cost.

The advantages of purchasing coal under specifications may be briefly summarized as follows:

1. Bidders are placed on a strictly competitive basis as regards quality as well as price. This simplifies the selection of the most desirable bid

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and minimizes controversy and criticism in making awards.

2. The field for both the purchaser and the dealers is broadened, as trade names are ignored and comparatively unknown coals offered by responsible bidders may be accepted without detriment to the purchaser.

3. The purchaser is insured against the delivery of poor and dirty coal, and is saved from disputes arising from condemnation based on the usual visual inspection.

4. Experience with the old form of contract shows that it is not always expedient to reject poor coal, because of the difficulty, delay and cost of removal. Under the present system, rejectable coal may be accepted at a greatly reduced price.

5. A definite basis for the cancellation of the contract is provided.

6. The constant inspection and analysis of the coal delivered furnishes a check on the practical results obtained in burning the coal.

7. Payment for on the quality basis incites the contractor to prepare the coal more carefully.

In the purchase of coal according to its heating value and composition an important detail, which seems not to be thoroughly understood, is the manner of making awards. Awards should not be made solely on the chemical analyses and the heating value determinations in the absence of information of the behavior of the coals in practical service operation, for while calorific rating allows an award to be made to the best economic advantage, other factors may, under certain conditions, have considerable weight, especially if uncertainty exists as to the suitability or adaptability of an untried coal to the plant for which it is purchased, and the consideration of this question must take into account the type and condition of furnaces and grates, the draft, the labor of handling coal and ash, the storage facilities, etc.

Two coals having the same percentage of ash by analysis may behave very differently in the furnaces, for one may clinker and the other not, the ash by analysis not indicating the extent to which the ash may fuse or slag on the grate bars and thus seriously interfere with the capacity and efficiency of the plant. The relation of the composition of the ash to its liability to clinker is a matter which is being studied, but as yet altogether satisfactory results have not been obtained. On the other hand, clinkering is frequently caused by the firemen slicing the fire too often and working the ash up from the grates into the hot coal bed, where it melts and fuses into heavy dense masses.

The chemical analysis of coal may not indicate whether the coal will cake in the furnace, thereby interfering with the draft and lowering the rate and completeness of combustion.

Different coals with the same percentage of volatile matter may not behave alike in the furnace because the proportion of combustible and non-combustible constituents in the volatile matter, the character of the combustible constituents, and the temperature at which they are given off in the furnace, vary in different coals.

In the absence then of information on the results which may be obtained in actual service to supplement the chemical analyses and heating tests, it may prove difficult to determine the award to the best economic advantage and service tests in the plant equipment will be required.

In comparing bids on the basis of the chemical analyses and B. T. U. of the coal offered by the respective bidders, the method used is to merge the variables,—ash, moisture, calorific value, and price bid per ton,—into one figure, the cost of 1,000,000 British thermal units. Any coals which have proved from experience or by practical test unsuited for the furnace and boiler equipment, or have failed to meet the requirements of the city smoke ordinances, may be eliminated from consideration regardless of their calculated costs per million B. T. U. and the remaining bids may be compared. The lowest bid then selected should be considered as a tentative award only, the final award to depend on the coal giving satisfaction in every respect in the plant equipment and on the satisfactory fulfillment of the contract.

The relative facilities, competency and responsi-

bility of the competing firms must, of course, also be considered in making awards.

Two classes of coal, anthracite and bituminous, are recognized and differentiated in Government specifications. By anthracite is meant the coal mined in Susquehanna, Lackawanna, Luzerne, Carbon, Schuylkill, Columbia, Sullivan, Northumberland, and Dauphin Counties, Pa. By bituminous coal is meant varieties other than anthracite, including the several grades of semi-bituminous and sub-bituminous.

The bituminous specifications require the bidder to specify the quality of coal offered in terms of moisture, "as received," ash, sulphur, volatile matter, and B. T. U., "dry coal"; these values becoming the standards of the contract to determine rejectable coal and the price to be paid for delivered coal.

The specifications allow a variation of 2 per cent. from the ash and heating value standards before making corrections in price. This is allowed to provide (a) for the reasonable variations in composition that, it is recognized, the same samples may show in the laboratory in two different determinations, (b) for variations that arise in preparing and reducing the gross sample collected from the delivery to a quantity convenient for transmittal to the laboratory, (c) for variation due to the collection of gross samples as representing the coal sampled, and (d) for allowing the contractor latitude in the preparation of the coal, since it is recognized that the quality of his coal as expressed in terms of ash and B. T. U. cannot be strictly controlled within narrow limits.

The specifications require the bidders to specify a maximum moisture content in the coal offered. This value becomes the standard of the contract. No price correction is made for deliveries containing by analysis a moisture content less than the standard, but the price is corrected for moisture in excess of the amount guaranteed by the contractor, the deduction being determined by multiplying the price bid by the percentage of moisture in excess of the amount guaranteed.

The fact is recognized that the amount of moisture contained in coal produced from day to day from the same mine, or group of mines working the same bed, is largely accidental, and is a matter over which the buyer and seller have only a slight control. However, in order to place a negative value on high-moisture coals and to protect the Government against the delivery of coals containing excessive amounts of moisture, the bidders are required to guarantee a maximum moisture content. Price corrections on account of excessive moisture are seldom necessary if the contractor does not guarantee a content lower than can be actually maintained on an average.

No corrections in price are made for variations in volatile matter, for the Government does not consider any scheme of applying penalties on account of such variations to be equitable, because the character of the volatile matter and its heating value are not necessarily indicated by a volatile matter determination, and because this determination is made by an empyrical method whereby duplicate determinations on the same sample may differ as much as 2 per cent. in different laboratories, or, in fact, in the same laboratory.

The bureau has received copies of commercial and municipal specifications drawn up apparently without regard to these facts. One specification, for instance, provides for a correction of 2 per cent. in price for each 1 per cent. of volatile matter in excess of the standard guaranteed. On a coal sold at $3 per ton, a deduction of 12 cents per ton for an apparent excess of 2 per cent. in volatile matter might be made when, in fact, the actual volatile matter of the coal was not above the standard. Specifications of this nature furnish legitimate grounds for opposition from coal companies and do much to discredit the specification method for the purchase of coal.

The results of tests and experiments show that the percentage of sulphur does not indicate the behavior of the coal in the furnace. For a long time it was thought that the sulphur formed clinker, but investigations point to the fact that sulphur is not the only cause of clinkering; in fact, there may be no difficulty from clinker in burning coal containing as much as 5 per cent. or more sulphur. The relative proportions of iron, sulphur, lime, alumina, silica, etc. in the ash affect its fusibility, whereas the method of firing and the rate of combustion are important factors in the formation of clinkers. At many power plants the fireman slices the fire too often and works the ash up from the grates into the hot coal bed, where it melts and fuses into heavy dense masses of clinker. At high rates of combustion the ash in a given coal may clinker (though at lower rates it does not), because of the ash being raised to the fusing temperature. Because of these variables no corrections in price for variations in sulphur are made under Government specifications, but the contractors are required to specify the sulphur content so that standards for the coals to be delivered may be established.

Many commercial and municipal specifications exact penalties for a slight increase in the sulphur content, although coal of high sulphur content may clinker less and its heating value may be higher. One specification received by the Bureau of Mines exacts a deduction of 5 per cent. in price for each 1 per cent. of sulphur in excess of the standard. In the case of a coal supplied at $3 per ton, the presence of 1 per cent. of sulphur in excess of the standard, as indicated by analysis, would often result in an unwarranted deduction of 15 cents a ton. Under such a contract, the variations which are recognized to exist in sampling and analysis may cause a contractor unjustly to suffer a heavy deduction.

Both the sulphur and the volatile-matter content should be used to classify coals and to identify the coal guaranteed. Variations indicating the substitution of an unsatisfactory coal should be considered cause for rejection of the coal or for cancellation of the contract.

For the purchase of the domestic sizes of anthracite coal, the Government has established a standard of ash content for each size. Coal containing ash in excess of a maximum limit is subject to rejection and to removal by the contractor at no cost to the Government, or if used it is subject to a deduction in price. B. T. U. standards are not used, as it has been determined that the heating value for the different sizes is, in the

main, a function of the ash content, varying inversely and in proportion with the ash; that is to say, if the ash content is increased, for example, 1 per cent., the heating value is decreased 1 per cent.

The power-plant sizes of anthracite may be purchased either under the specifications which are used for bituminous coal, the bidder guaranteeing the heating value, ash, moisture, etc., or under specifications similar to those for domestic sizes, wherein a standard of ash or B. T. U. or both is established.

The cost of collecting, crushing and preparing samples of the large sizes of anthracite coal, the expense of analyzing the samples, the fact that samples weighing several hundred to a thousand or more pounds, which are required to insure reliable results are rendered largely waste after being crushed, and the further fact that the yearly contracts are for relatively small tonnages with deliveries of 1/2 to 50, seldom more, to a building, have made the cost of regular sampling of anthracite coal prohibitive, or greater than any probable saving which would result from the application of the specifications used for the purchase of bituminous coal.

One of the serious drawbacks to the general adoption of the specification method for the purchase of coal is the difficulty of obtaining at reasonable cost samples of coal that can be considered fairly representative of the commercial product delivered in wagons, railroad cars, or ships. Therefore, the method of taking and preparing samples for shipment to the laboratory has been given fully as much care as the making of the analyses and tests.

The method employed is to select portions from all parts of a consignment or delivery of coal and to systematically reduce the gross sample, obtained by mixing these portions, to quantities that the chemist requires for making ash, and other determinations, or that can be burned conveniently in the calorimeter, an apparatus for determining the heating value. The gross sample should be so large that the chance admixture of pieces of slate, bone coal, pyrite, or other impurities in an otherwise representative sample will affect but slightly the final results. Increasing the size of the gross sample tends toward accuracy, but the possible increase is limited by the cost of collection and reduction. In reducing the gross sample by successive crushings and halvings or fractional selections, the object is to procure a small laboratory sample that, upon analysis, will show approximately the same composition as the gross sample itself, or, in fact, as the entire quantity of coal from which the gross sample was obtained.

The method of sampling is very often given scant mention in specifications and contracts, thereby leaving one of the most important features determining the successful and satisfactory application of the specification method of the purchase of coal almost wholly in the hands of the purchaser, the seller having little or no means whereby he can exercise a control of the manner and method of collecting and preparing samples that should represent the coal furnished. It is as essential that an established and agreed-upon method of sampling be followed, as it is that the sample be analyzed by a reputable laboratory; in fact, the sampling is of first consequence, for if a sample is haphazardly taken and carelessly reduced to a quantity convenient for transmittal to the laboratory, and hence is non-representative, it is usually impossible or impracticable to get another sample; whereas, if the analysis and test of a representative sample are in error, the remaining part of the sample can be analyzed and tested, and by another laboratory if desired. Unwarranted corrections in price and resulting injustice and hardship to the buyer or seller may easily and unintentionally occur through lack of perception of the relative importance of sampling and failure to observe proper methods of collecting and preparing samples. By clearly setting forth the method of sampling as a part of the contract, the seller or the buyer has something tangible on which to base legitimate complaints if samples are not properly collected and prepared. As reflecting the importance of sampling and the consideration which must be given it in the specifications, a contractor protesting against loose sampling expresed himself somewhat as follows:

"For me to consider selling coal under the specification method as a business proposition and not a gamble, the sampling must be thoroughly and systematically done and by an experienced man who understands the significance of his work." Because of its importance, Government specifications, give in considerable detail, the method of sampling.

The best opportunities for procuring representative samples are afforded while the coal is being unloaded from railroad cars, ships, and barges, or while it is being dumped from wagons. Once the coal is stored in piles or bins, or loaded on vessels, the procuring of representative samples is practically impossible unless the whole quantity of coal is immediately handled again and the conditions for sampling become favorable. Samples collected from the coal exposed in piles, bins, barges, or ships can be considered representative only under the condition that the mass of coal is homogeneous throughout. Such a condition is highly uncertain and even improbable, and the analysis of samples collected from the surface may give results that are very unreliable as indicating the nature of the entire quantity, and that may be worthless as a basis for determining an equitable price to be paid for the coal.

A shovel or a specially designed tool may be used for taking portions or increments to make up a gross sample. The sample should never be picked by hand, for the personal equation factor is thereby multiplied and the collector may be too liable to err in judgment.

The personal equation is an uncertain factor is the collection and preparation of samples by manual labor. This factor can be greatly reduced by the installation of a crusher and mechanical means for reducing the sample in quantity. Such installations prove expedient and economical for contracts for a large tonnage. If one chute or conveyor is used for delivering a considerable quantity of coal to or from wagons, cars, or ships, mechanical means may be devised for collecting portions from fractional parts of the discharged

coal, and thus the gross sample may be mechanically and automatically collected.

Though a gross sample may be collected ever so carefully and may represent the coal sampled, unless it is prepared and reduced in quantity in accordance with well-recognized principles, the results of analyses and tests may be worthless for determining equitable settlement for the coal.

The proper preparation of a gross sample for shipment to the laboratory involves three operations: (1) crushing, (2) mixing, and (3) reduction in quantity. The operations must proceed in stages according to a prearranged plan and in a systematic manner until a final sample of about three pounds is obtained. This three-pound sample should be placed in a container and sealed air-tight and forwarded to the laboratory for analysis.

The advantages of definite specifications for purchasing coal, the results obtained from the method, together with the analyses and tests of coals delivered under Government contracts during the fiscal year 1909-10, are published in Bureau of Mines Bulletin 41, "Government Coal Purchases Under Specifications." Directions for sampling and types of specifications are given in Bureau of Mines Bulletin 63, "Sampling Coal Deliveries and Types of Government Specifications for the Purchase of Coal."

EGYPTIAN COTTON CULTURE IN THE SOUTHWEST

By CARL S. SCHOFIELD, Agriculturist in Charge of Western Irrigation Agriculture, United States Department of Agriculture, Washington

Since 1902 the Bureau of Plant Industry has been experimenting with Egyptian cotton in the irrigated sections of the Southwest. At the close of the season of 1911 these experiments had reached a stage which seemed to justify the trial of this crop on a small scale by farmers in the Salt River Valley in Arizona and in Imperial County, Cal.

In the spring of 1912 a supply of seed was distributed by the Department of Agriculture for planting by a number of farmers. Most of the seed so distributed was of the Yuma variety, a new type developed in Arizona as a result of careful selection which had been carried on for several seasons. The investigations and experiments made in connection with the breeding and acclimatization have been reported in numerous publications of the Bureau of Plant Industry. The seed distributed in 1912 was entirely free from contamination with the degenerate type known as Hindi cotton, which infests practically all of the cotton grown in Egypt. This seed was distributed to about 75 farmers, and about 530 acres were planted in the spring of 1912. The location of these farmers and the acreage in each locality were as follows: In the Salt River Valley, 32 farmers planted 303 acres, besides 29.5 acres planted on the Indian reservations; in the Colorado River Valley north of Yuma, Ariz. (vicinity of Bard, Cal.), 19 farmers planted 44 acres; in the Imperial Valley, Cal., 25 farmers planted 122 acres. In addition to this acreage in the Imperial Valley, there were 20 boys who planted one-half acre each under the direction of Walter E. Packard, of the California Agricultural Experiment Station, cooperating with the Bureau of Plant Industry. Near Heehicera, Mexico, south of the Imperial Valley, there was one field of 30 acres.

These experimental plantings by farmers were made under the supervision of Argyle McLachlan and E. W. Hudson, both of the Bureau of Plant Industry, Mr. Hudson devoting his attention chiefly to the work in the Salt River Valley.

Owing to the various causes, a portion of the acreage planted to Egyptian cotton failed to produce a crop. Among these causes was the lack of irrigation water for some of the fields, while the soil in other fields was too salty, and in one section high ground water, resulting from a flood in the Colorado river, killed the crop in midsummer. About 480 acres came through the season to harvest. From this acreage 375 bales of about 500 pounds each were finally picked and ginned. Of the total number of bales 262 were ginned in the Salt River Valley, 17 in the vicinity of Bard, Cal., and 96 in the Imperial Valley. These figures do not include 24 bales produced on the experiment farms at Sacaton, Ariz., and Bard, Cal.

The yields from different fields varied greatly. Many of the farmers who planted cotton were not familiar with the requirements of the crop, and some fields were given very little attention after planting. The average yield of lint per acre, determined from the total quantity of lint known to have been picked and baled and the total number of acres upon which this cotton was produced, was approximately 400 pounds. The acreage upon which this computation is based included, however, much land on which the crop was very light.

A number of fields were measured during the season, and records were kept of the crop harvested. The yields determined from fields in the Salt River Valley are given in Table I.

Table I.—Yields of Ginned Cotton from Certain Measured Fields of Egyptian Cotton Grown by Farmers in the Salt River Valley in 1912.

Size of Field. Acres.	Yield of Fibre. Total. Pounds.	Yield of Fibre. Average per Acre. Pounds.
3.38	2,527	747
5.32	2,872	729
5.35	3,818	714
1.42	994	700
4.75	3,245	683
15.25	10,180	667
10.35	5,937	573
2.89	1,461	506
1.62	794	490
13.45	6,558	488

The yields of cotton shown in Table I vary from slightly less than 1 bale per acre to nearly 1 1/2 bales per acre. While these yields were much above the average for the entire acreage devoted to the crop, they are sufficient in number to indicate what may be expected by the better farmers on rich land which had previously produced alfalfa, as was the case with most of the yields reported upon.

Two of the yields reported in Table I were those obtained by Pima Indian farmers on the Sacaton Reservation. One of these Indians made a crop of 994 pounds and the other 794 pounds from their fields of about 1 1/2 acres each.

Table II.—Yields of Ginned Cotton from Certain Measured Fields of Egyptian Cotton Grown by Farmers in the Imperial Valley, Cal., in 1912.

Size of Field. Acres.	Yield of Fibre. Total. Pounds.	Yield of Fibre. Average per Acre Pounds.
11.00	6,105	555
4.76	2,537	533
1.32	620	470
5.00	2,000	400
5.09	2,015	396

The yields from fields in the Imperial Valley as shown in Table II range much lower than those from the Salt River Valley reported in Table I. The lower yields were due chiefly to the less careful preparation of the land and handling of the crop by farmers in the Imperial Valley rather than to any essential difference in natural conditions. This is proved by the fact that some of the boys mentioned obtained yields from their half-acre fields approximating Salt River Valley figures.

The results of the past summer indicate in a very striking manner the importance of thorough preparation of the land before planting and the need of careful attention to the proper cultivation, irrigation and thinning of the crop during the early stages of growth in order to secure good yields. It is also clear that while profitable crops of Egyptian cotton may be produced on new land or following grain or a previous crop of cotton, the best results are to be had where cotton follows alfalfa. And, while the evidence is not absolutely conclusive, it seems reasonably certain that cotton should not follow sorghum or milo, which crops appear to have a depressing effect on the following cotton crop.

CHARACTER AND VALUE OF THE CROP

With but few exceptions, the cotton was picked carefully and the seed cotton as delivered at the gins was clean and free from trash. This made it possible to turn out a high grade of lint. The bales were well packed to a density of from 15 to 20 pounds per cubic foot, and they were well wrapped with burlap bagging. The average tare, including bagging and ties, was about 14 pounds per bale.

In quality—that is, in length and strength of staple—the crop was very uniform and satisfactory. Some of the lint stapled only 1 3/8 inches, but the bulk of it was fully 1 7/16 inches long and some was slightly over 1 1/2 inches long. While the entire crop has not yet been sold, the prices for the sales so far reported have been approximatly 21 cents per pound, net weight, delivered on the cars at the shipping point. These prices are said to have been based on the sale of the crop at 23 cents per pound at New England points, the margin of 2 cents being required to pay the charges for freight, brokerage and other marketing expenses.

A small portion of the cotton was of low grade, due to careless picking, or was of comparatively poor quality, due to bad conditions in the fields. This cotton brought a somewhat lower price. The crop from some fields had to be shipped to assembling points to be made up into carload lots, which increased the cost of transportation. However, the bulk of the crop has brought about 21 cents per pound at this shipping point, which, considering the yields previously mentioned, is a satisfactory return.

In a few cases the grower sold his crop in the seed; that is, unginned. In this condition it brought 4 3/4 and 5 cents per pound, and at this price the purchaser was able to pay the cost of ginning and baling and to sell the fiber at 21 cents with a safe margin of profit.

From the results of the ginning records made during the season it appears that a little less than 1,800 pounds of seed cotton of the Yuma variety may be expected to give a 500-pound bale of fiber. There have been marked variations in this respect. The observed range of percentage in fiber from seed cotton has been from 25.2 per cent. to 31.7 per cent., with an average of about 28 per cent. for the entire crop.

In the Salt River Valley a large proportion of the seed resulting from the 1912 crop has been reserved or sold for planting in 1913. The price when sold for this purpose has been from 1 1/2 to 3 cents per pound. In the Imperial Valley most of the seed was sold to an oil mill at the rate of $15 per ton. Some of the seed has been used for feed, and when so used was considered as worth about 1 cent per pound. The seed is a factor of appreciable importance in the crop return. Even when sold to the oil mill it brings a sufficient return to pay more than the cost of ginning and baling the crop.

COST OF PRODUCTION

The cost of producing Egyptian cotton, exclusive of harvesting the crop, varied between wide limits. It has been possible in a few cases to ascertain the cost of production; that is, the cost of labor and irrigation water, but not including interest on the land investment. On the larger fields, where teams and machinery could be used to advantage, this cost, exclusive of picking, ginning and baling, ranged from $11 to $16 per acre. One of the important factors in the cost of production was the preparation of the land. Where it was necessary to subdue a tough sod of alfalfa and Bermuda grass the cost was high. This was particularly the case where the work early in the season was not done thoroughly. The best results in crop yields as well as the greatest economy of labor were secured where the early tillage was thorough and the land was brought into the best possible tilth before the crop was planted.

The cost of picking Egyptian cotton was no less variable than the cost of production. On the irrigated land of the Southwest the cotton plants grow very large, with many branches. When loaded with a heavy crop the plants bend over and become so entangled that it is difficult to get through the field. Where the acreages were small for each family, no cash outlay for picking was needed. In the Imperial Valley, where labor was

scarce and there was a lively demand for pickers in adjacent fields of short-staple cotton, it was sometimes found necessary to pay from 3 to 3 1/2 cents per pound for picking. In the Salt River Valley, on the other hand, the labor supply was adequate and the bulk of the crop was picked for 2 cents per pound. These prices, of course, refer to the seed cotton.

It was found that good pickers averaged about 100 pounds of seed cotton per day where the crop was good. In several cases good pickers brought in from 125 to 150 pounds per day when conditions were especially favorable. Pickers may be expected to average from 70 to 100 pounds per day throughout the season, and when working at this rate the seed cotton should be delivered very clean and free from trash. On the basis of these results it is estimated that one picker will be required for each two or three acres of cotton. The picking season in 1912 began about the middle of September and closed early in February, 1913, though for the best results it should have closed a month earlier, as the late-picked cotton was generally of poor quality.

The ginning and baling of Egyptian cotton is more expensive than the similar operations for Upland cotton. From the results of last year's experiment it is not possible to estimate with accuracy just what the cost will be when a larger crop is available. The arrangements for ginning the first crop were made more with a view to economy in purchase than in operation, and much of the work was done at a disadvantage. From the data obtained it appears that the ginning and baling cost last year was $6 to $10 per bale. The roller gin used for the Egyptian cotton was the same as the one generally used in the Sea Island district of South Carolina and Georgia. The turnout averaged about 1 bale per day from each gin, though under favorable conditions it was possible to gin 1 1/2 bales with each machine.

The cost of producing an acre of Egyptian cotton, estimating a yield of 1,800 pounds of seed cotton per acre, may be summarized as follows: Seed, tillage, and irrigation, $15; picking, $36; ginning and baling, $10; making a total cost of $61 per acre, exclusive of interest on land investment. It should be kept in mind that these figures are merely approximations. The actual costs will be found to vary between wide limits, both above and below these figures.

CARE OF BELTS IN COTTON MILLS

By DUDLEY WILCOX, P. O. Box 562, Hartford, Conn.

Most mills leave the care of their small belts to the overseers of their respective departments. Walking through a mill, a visitor will find the various rooms filled with belting in the most diverge states of preservation. A weave room will have belts made up of four or five pieces of leather joined together with belt hooks or lacing of some sort, whereas it has been proved beyond a doubt that belting lasts about twice as long when lapped and cemented together, as when an inferior joint, like wire lace or hooks of any type, is used. Usually one inferior joint is necessary for convenience in caring for belts, but no belt should be used with more than one such joint. A room of spinning frames will have a pile of antiquated belting in the corner and because the mill has no belt checking system, it is impossible for an owner to say how much of this old leather is walking out of the mill as the soles of shoes. A good deal of new leather belting may be going out in the same way.

Some mills will have the belts well cared for in the matter of laced joints and loose leather in the corners, but the overseers insist in keeping the belts so tight that the shaft bearings call for too frequent attention, and the belts last so short a time that the belt bill is much larger than that of other rooms with the same number of belts doing the same work. Indeed some mills do not even trouble to keep the cost of belting dealt out to individual parts of the mill.

Sometimes the visitor will find a machine shut down and will find the belt surface glazed and cracked—a condition from which belts should be protected by cleaning and greasing as often as necessary. If the visitor arises early enough and goes to the mill at the whistle hour of a damp spring morning, he may find some one to a dozen machines in the mill out of commission, because the dampness of the atmosphere has stretched the belts to such a point that they will not drive their machines. At least this has been observed in a mill where the belts from the overhead shafting to the machines were quarter-turn belts.

Belts may be found in many places running half off and half on their pulleys, which ruins belts in a few months. Belts too slight for their work are seen stretching almost to breaking point and requiring very frequent attention. Wide thin belts are used where there should be narrow thick ones.

One of the worst features of the usual practice in caring for machine belts is the small regard paid to tension. The average overseer is quite contented if a belt will drive a machine after he has fixed it. He only swears when he finds that so much has been taken out of the belt that it will not go on to the pulleys, or will heat up the bearings when he does get it on, or when so little has been taken out that it will not drive the machine any better than it did before. As a matter of fact, it has been proved conclusively by a series of experiments lasting over nine years, that tension of belts has more to do with their life than any other one factor. Dr. F. W. Taylor, of fame as the father of scientific management, presented a paper to the American Society of Mechanical Engineers, describing his experiments and conclusions on the subject. He states that belt tensions should be mechanically measured.

The method usually employed in taking up the tensions of belts is somewhat as follows: The belts are allowed to run until one of them becomes too loose to drive its machine to capacity. Then the machine is stopped while an amount guessed at by the operator or overseer is cut out and the belt is put on again. This not only entails loss of time in machine production while the machine is stopped, but usually means that the belt has been slipping for some hours before the operator noticed it, or wanted to take the time to stop and fix it. It means at times that injurious substances

like resin are applied to belts to make them pull a little longer. A friend of mine recently caught one of his men putting a well-known brand of mechanic's soap paste on his belt. It made the belt pull better for a time, but the results to the belt can be readily imagined.

The average leather belt during its life stretches at least 6 per cent. of its original length, stretching rapidly from the beginning till a period of four to twelve months has elapsed, then a stretching almost uniformly for a number of years dependent upon the care it receives until finally its elasticity is practically gone, and the question arises whether it is cheaper to keep on repairing it every week or two or to buy a new belt. It has been found that belts well proportioned for the work required of them need tightening at intervals of two to six months.

Because of these conclusions and usual lack of uniformity in the care of belts, a system and apparatus have been devised by means of which belts may be cared for in the most economical manner. At the same time interruptions to manufacture, due to failure of belting, may be reduced to a minimum.

When this belt system was first applied in mills, a bench was built for weighing the tensions of belts by means of spring balances. Without going into the mechanical details of this bench, it is enough to say that all belts in the shop had to be brought periodically to the bench for inspection and repair. The exact lengths of all belts in the shop had to be taken with a steel tape over the working pulleys and recorded on a form so that each belt could be cut to the proper length at the time of inspection. This bench is now on the market and is in use in many shops. I believe it is the proper thing for all belts whose tensions cannot be weighed with the apparatus about to be described. But it was found to be a good deal of trouble to bring all the small belts away from their machines to one corner of the mill to have their tensions weighed. With this inconvenience in mind, a portable device has been perfected for measuring the tensions of small belts while in place on their pulleys.

By means of this device, the tensions of all belts up to four inches may be measured accurately while belts are in working position over their pulleys. With it belts may be inspected in about a quarter minute each, and the amount necessary to be removed to bring the belt up to its proper maximum tension is indicated directly on the scale.

Each belt in the mill should have a data sheet with the following information:

1. Location of belt, to be given in symbols or numbers.
2. Date put in use.
3. Date taken out.
4. Cost of belt.
5. Cost of maintenance.
6. About twenty spaces for records of individual tightening and attention, with the following headings for columns:
   a. Date re-tightened.
   b. Tension before tightening.
   c. Tension after tightening.
   d. Amount taken out.
   e. Date tension should be taken again, to be determined from the previous record of the belt.
   f. Date cleaned and greased.
   g. Date to be cleaned and greased again.
   h. Remarks on condition of belt.
   i. Name of workman who repaired belt.
   j. Time required to fix belt, . . . minutes.
   k. Cost of work.

For each different type of belt, there should be a sheet containing spaces for the following information.

1. Room where belts are located.
2. Purpose, as main machine belt, etc.
3. Approximate length over pulleys.
4. Width.
5. Thickness.
6. How fastened.
7. Maximum velocity.
8. Minimum velocity, if variable.
9. Maximum tension.
10. Minimum tension.

While it may not be practicable to run such a system always, it is an excellent thing to show a mill man where he stands, and to put his belt costs where he can see them at least once.

The next step is to set dates for the tightening of belts. New belts will require tightening after twenty-four hours of use, then after forty-eight hours, then after four days' service, and so on, doubling the interval until the proper space of time for that series of belts is reached. This can be determined only by experience. Different belts in the same room may be given different intervals and the records will soon show to the superintendent the proper interval between inspections. The record costs will reveal immediately any inferior grades of belting. The cost of maintenance should not exceed 14 per cent. per year of the belt's initial cost. As a rule mill owners do not know what this annual per cent. cost of belts is, but in shops where the system has been installed, it has been found that the cost of maintenance had exceeded 34 per cent. until the system was put in, after which it was reduced to about 14 per cent.

After the first data have been collected, a ticket should be made out for each belt in the shop, carrying the belt symbol and the maximum and minimum tensions. These tickets are issued like time cards to the man assigned to caring for belts. This man fills out on the ticket the time spent on the belt and the amount taken out in tightening it. He also adds, if necessary, any notes on the condition of the belt, such as "dry," "torn at lacing," etc. These items are entered on the belting record sheet for that belt, by a clerk. Each mill should keep all the records of its belting together, and the clerical work should not take over a half hour a day at the most. The records will then be in shape for the superintendent to tell at a glance, while on his rounds, the condition of all the belts in the mill.

Belts should be taken up at regular intervals in advance of the time they would begin to slip. This work should be done at the noon hour or after closing time at night, so as to reduce the interruptions to manufacture to a minimum. When the interval between tightening has been determined, the total number of belts in the mill should

be divided by the number of working days in the interval and the tickets should be issued so as to give the belt fixer an equal number of belts to inspect each day. To facilitate keeping track of the tickets, a "Tickler" file should be provided. This consists of a series of portfolios numbered by the days of the month and covering twelve months. When the belts for one day have been inspected and the tickets turned in and the notes copied on the belting record, new tickets are made out dated in advance according to the predetermined interval, and these advance tickets are filed in the portfolio under the corresponding advance date. Each day, after the system is under way, a set of belting tickets will be taken out of the tickler and will show what belts need to be tightened.

So far as possible, belts should be taken care of by one man, but if the belt man is not at hand when an accident occurs, or a belt breaks, due to its age, the overseer or machine operator should fix it at once and make a note of the matter so that the records may be complete. The belt fixer should check up any work done on belts by others than himself and should see that the tensions of repaired belts are not above the prescribed maximum.

The following data, formulated through years of painstaking experiment, gives a brief resume of the important points in Dr. Taylor's paper mentioned above, together with conclusions reached by the engineers of the Tabor Manufacturing Company from their combined experience in installing systems for the care of belting.

The number of lineal feet of double belting one inch wide passing over a pulley to transmit 1 h. p. should be 950 to 1,000. Former estimates have been based on the tensile strength of belting, taking an arbitrary factor of safety as the proper determining figure. Dr. Taylor's experiments dealt with the life of belting and the frequency of interruptions to manufacture, factors which proved it advisable to use belts about twice as heavy as had been used before.

Belts last longer and are more satisfactory when narrow and thick than when wide and thin. Messrs. Lewis and Bancroft proved conclusively in their experiments that no marked difference could be detected in the power required to run a wide double belt and a narrow light one at the same tension and at moderate speeds. Belts should not be allowed to run in waves. Increasing the thickness in proportion to the width will prevent waves. A thick and narrow belt has less air resistance than a thin wide one.

As mentioned before, it is most important to have but one laced joint in the belt if economy in belting is desired.

Belts should be cleaned and greased every five or six months under ordinary conditions, and when atmospheric or other conditions cause belts to dry out rapidly, the interval should be shorter.

Belts should be run with the grain side next to the pulley. When belts are scraped clean, care should be taken not to scrape off the surface of the grain.

Belts should be run so that the feather edge of the lap on the side next to the pulley points away from the pulley as it approaches it.

Short pieces of belts should be cleaned, scarfed and cemented together.

New belting should be issued only when an equal length of old worn out belting is returned to the belt room.

DACCA MUSLINS

By E. N. MURTI, Mandapaka, Tanuku Talug, Kristna District, Madras, Presy, India

The locality most celebrated for the manufacture of these cotton fabrics is the district of Dacca, one of the principal divisions of eastern Bengal. The district itself produces the cotton required for manufacturing the Dacca muslin. The plant is annual and attains a height of four to five feet. It is a variety of the Gossypium Herbaceum.

Two varieties of cotton are raised:

1. Photee or finest kind, which has been cultivated in the district from time immemorial, and is grown only in certain localities situated along the banks of the Brahmaputra or its branches and the Megna.

2. Bairaiti which is raised in the eastern part of Bengal.

In 1800, the commercial resident of Dacca speaking of the sites of cultivation for photee cotton, remarks:

"A tract of land extending from Feringy Bazar, twelve miles southeast of Dacca along the banks of the Megna to Edilpore, twenty miles north of the sea, occupying a space of about forty miles in length and in some places as far as three in breadth, and situated in the pergunnahs of Kidderpore, Bickrampore, Rajenagur, Cartickpore, Serampore and Edilpore, is considered to produce the finest cotton raised in the Dacca province, and I believe, I might add, in any part of the world, since no cotton that has yet been compared with it, whether the produce of India, or of the Islands of Mauritius or Bourbon, whose cotton is celebrated for superior quality, has been found equal to it.

"The superiority of the cotton can be accounted for by the following facts. 'As the tide rolls in with the water of the Megna, which overflows part of the country during three months in the year and deposits, as it subsides, sand and saline particles which very considerably improve and fertilize the soil which consists of light sand and brown earth. In addition to the above sites, the banks of Luchia from the Dulaseree river to a little above Roopgunge, about sixteen miles in length, and a few miles on the banks of Brahmaputra, north of the Dulaseree, furnish the greater part of the kapas used in the Dacca province. Of the rest, some is grown in Buldecal, Bowal and Alepsing and some imported from Boosna in the adjacent district of Rajeshyi.'"

In the preparatory operations for its cultivation the agriculturist in the first place takes special care in keeping the seeds in good condition. During the rainy season (July, August, September) when the seeds are very much liable to be deteriorated owing to too much damp present in the climate, the ryot puts the seeds with their lint on them into an earthen jar (its mouth being tightly packed) the inside of which is carefully smeared with ghee (clarified butter) or oil, which makes

the vessel damp proof, and allows it to hang from the roof of his kitchen, which is the only place where the fire is kindled. The unginned seeds with the lint on them are sown in November in parallel rows about one and a half feet apart, and a distance of about four inches from each other in the rows, each seed being moistened with water before it is dropped into the grounds. Two crops are raised, one in April and May, and the other in September and October. The former yields the finest product and is grown extensively.

About four and a half pounds of seed, sown in a field measuring 25 square yards will yield about 160 pounds of kapas (seeds and lint separated), provided the season is favorable. It has been estimated that nearly two pounds of seed cotton contains about one-fifth of its weight in the lint cotton, and which according to the commercial resident, varies in the fineness of the staple about one-fifth of the above lint, which adheres to the seed, is capable of being spun into finest thread, while the remaining part is used for thread of inferior qualities.

The Baruis (betel leaf growers) were considered to be the best growers of cotton in those days, but the "cultivation has declined with the manufacturers of the district and it is said that the cotton has somewhat deteriorated in the fineness of its staple."

Before I describe to you the primitive methods of spinning, I would like to draw attention to the crudest appliances which they used to handle. Here nature supplies them everything in its simple and pure form; but it must be admitted that the men who first brought into use these simple means really possessed very highly inventive qualities; because "spinning is not an inherent human capacity as it is in spiders." Surely "imagination and intelligence were present at the birth of the first spun thread." Our machinery of today is nothing but elaborate imitations of these simple forms. As we shall proceed in describing the processes, we shall see how much our present and past mechanics owe to the inventive genius of some persons in that dark and distant epoch.

When the cotton is picked from the pod, the seeds come with it; after being picked, it is necessary to clean it thoroughly from many foreign matters, and therefore fragments of leaves and stalks are carefully picked out with the fingers. All this laborious task of cleaning is done by the women, who also spin the yarn. "The seed cotton is then carded with the jaw bone of the boalee fish, the teeth of which, being small, recurved, and closely set, act as a fine comb in removing the loose and coarser fibers of the cotton, and extraneous matter, such as minute particles of earthly and vegetable matter from it."

The next process to be considered will be better understood by the term "ginning." This is accomplished by placing a small quantity of cleaned cotton upon a smooth flat board, and then by means of an iron spindle moving it backwards and forwards with the hand, the seeds are taken out of the fibers without being crushed. "Bowing" comes next, which will be better understood by the term opening, or scutching, or blowing, when the cotton fibers receives a series of continual blows, from a hand bow which actually does the function of the beater in an opening machine, and which is constructed of a piece of bamboo with two elastic slips of the same material inserted into it, and strung with a cord made usually of catgut, twisted together.

The bamboo slips are movable within the center piece, and in proportion they are drawn out to the extent, or pushed back, the tension of the cord is increased or diminished. This process of bowing brings the cotton into a downy fleecy condition and when spread out can be easily lapped around a thick woolen roller. This roller is afterwards taken out, and the cotton is pressed between two flat boards. It is next rolled round a piece of lacquered reed the size of a quill; and finally enveloped by means of a thin skin of the Cuchia fish which prevents the cotton from being soiled or dirty, while it is held in hand during spinning.

So far we have the preliminary preparations for spinning, now we shall present the spinning proper, where we shall see with what simple apparatus these women could spin such exquisitely delicate yarn, which has startled the whole civilized world for its extraordinary fineness.

The spinning apparatus consists of:

1. A roll of cotton carefully covered with a thin skin.

2. A metallic spindle of 10 feet to 14 feet in length, almost as thick as a stout needle, though sometimes a slender piece of bamboo is used instead of the metal.

3. A piece of cocoanut shell or some substance which is smooth as well as hard, embedded in clay.

4. A hollow stone or clay pot containing some chalky powder.

The whole appliance is generally carried on in a flat bamboo basket.

A bit of unbaked clay is attached in the lower end of the spindle; thus giving it sufficient weight in turning it steadily on the hollow smooth surface of the shell. The spinster holds the spindle in an inclined position, keeping the heavy end always in contact with the smooth surface, and turns it round with the thumb and forefinger of her left hand, while the cotton is supplied at the same time with her right, being particularly careful in drawing out single filaments from the roll. The chalky powder keeps the fingers always dry.

When a certain length of thread is thus spun, it is wound on the spindle. The process exactly resembles the modern mule, spinning as far as its principle of the intermittent spinning operation goes; here the spindle is stationary, while the feed part always recedes from the spindle point, which we see exactly reversed in our present mule spinning.

In order to attenuate the fibers successfully during dry weather, the spinning was often accomplished over a shallow vessel of water, the evaporation from which keeps the surrounding atmosphere humidified to the necessary degree; this enables the spinners to form the filaments into threads successfully. The Dacca spinners generally worked from soon after early dawn to nine or ten o'clock and from three to four in the after-

noon till half an hour before sunset, these being the hours most suitable for fine spinning.

The method of measuring the length as well as the weight of a given skein of thread is very crude. The spinners and weavers generally used to judge the finest of the thread by sight only. A hath (cubit) was their unit length which is equal to almost 19 3/4 inches, a distance covered by the whole length between the knuckle of the elbow joint and the tip of the middle finger. Their weight unit was a rattee (about two grains Troy). These are tiny seeds of oval shape of deep red color with a black spot on the top, and they are obtained from a particular plant of a shrubby nature.

The standard quality of yarn used for the manufacture of these fine muslins, varied from 140 to 160 cubits in length to one ruttee, which comes from about 316s. to about 366s. of the present system.

I shall now describe the preparatory operations for weaving, and weaving itself. Our first consideration in this chapter would be the process of winding. The weaver gets his yarn from the spinner in the form of skeins wound on small pieces of hollow reed. Before he commences the process, this yarn is steeped in water for a few hours as it comes from him wound on the reed.

The winding appliance consists of (1) a reel made of thin smooth splints of bamboo, which is mounted on the upper end of a long stick, (2) a piece of bamboo, one end of which is divided into two parts, and thereby acting as bearings to hold a piece of stick on which is mounted the hollow reed, (3) a smooth cocoanut shell over which the reel shaft revolves.

The weaver holding the split bamboo piece by means of his toes in front of him, turns the long stick of the reel with one hand keeping all the time the reel in its vertical position, which the first two fingers of the other hand act as guides to the yarn in its passage from the reed to the reel. When the yarn is in the form of a skein, it is first placed on a small wheel made of thread and fine bamboo splints, from which it is afterwards drawn off and wound upon a reel.

The yarn spun for warp is generally a little coarser than the weft, and in order to stand the unavoidable stresses during the process of weaving, the warp is required to undergo the following processes.

The warp yarn is first steeped in water for three consecutive days during which period the water is changed twice. On the fourth day it is taken out thoroughly rinsed by means of two sticks which are put into the skein and twisted in opposite directions. It is then left upon the sticks and exposed to the sun to dry in its tightly twisted condition, which is afterwards untwisted and put into water mixed with fine charcoal powder, lamp black or soot scraped from the surface of an earthen cooking vessel. They are kept in this mixture for two days, then rinsed in clear water, wrung out and hung upon pieces of stick placed in the shade to dry.

Each skein having been again reeled is steeped in water for one night, and is next day opened up and spread over a flat board, upon which it is smoothed with the hand, and rubbed over with a paste or size made of Khoie (fried paddy), and a small quantity of fine lime mixed with water. After being sized the thread is wound upon a reel, every turn of which is kept as wide apart as possible, in order to get it dried quickly. It is afterwards exposed to the sun. All the threads are then rereeled and sorted and divided into three grades according to their fineness: (1) the finest for the right hand side, (2) the next finest for the left hand side, (3) the coarsest for the center.

The weft is prepared two days before the actual weaving. A quantity of thread for one day's work is steeped in water for twenty-four hours. It is then rinsed and wound on a large reel, and then lightly sized in the above way, and dried properly. This is a daily job, continued until the cloth is finished.

Warping is usually done outdoors. The weaver selects a spot near his house, where he can arrange his warping appliance to its best advantage. The apparatus consists of four short bamboo posts, which are fixed at measured distances, depending upon the length of the cloth to be woven, and several pairs of rods between them. They are arranged in two parallel rows with sufficient space between them.

The weaver holding a small wheel of warp yarn in each hand, walks backwards and forwards along the two rows all the time laying down the two threads over the posts. The intermediate pairs of rods are intended for supports and as well as to form the end and end base, which is accomplished by crossing his hands between each pair of rods. At right angles to the handle of the swift there is a thin rod having a glass ring at its end and through which the thread passes.

The reeding is done sometimes immediately after warping, and in some cases not until the warp is wound upon the back beam. The reed is made of very fine bamboo splits, firmly fixed between two split canes. The finest reed that is used in weaving Dacca muslin contains nearly 2,800 dents in 40-inch space.

The whole bundle is hung from the roof of the weaver's hut while one is unfolded and spread out nicely and hanging down to within two or three feet from the ground. The reed is fastened by means of thin cords, and it hangs in front of the unfolded yarn. Two men take their seats one on each end of the warp and having cut a certain number of the looped ends by means of a knife, they begin to draw the threads with the reed. The drawn ends afterwards are gathered and knotted in bunches thus keeping the reed with the warp.

The beaming process closely resembles the modern Yorkshire method of dressing, where every thread requires careful attention, in respect to its order and tension. The operation is done generally out of doors. The warp is bundled round the reed, and a bamboo rod is passed through the knotted bunches at the termination of the reeding.

One man holds this bundle, while the other end is unfolded, and a thin slip of bamboo stick having been passed through the loops, is received into the longitudinal groove of the end beam, and is fastened by means of string. The beam is then supported on two loops formed by stout cords, which

in their turn are suspended from two short wooden posts. The selvedge threads of the two ends are brought to a distance commensurate with the intended breadth of the cloth. The portion of the warp thus being unfolded and nicely spread out, the man who holds the bundle stretches it evenly, while two workmen proceed to arrange the threads in the middle.

Eventually the threads are brought into their parallel state by means of an elastic piece of cane which has been previously softened and beaten out at one end into the form of a brush. The cane is held in the form of a hand bow, and it gently taps over the stretched ends. When a certain length of the warp is thus arranged, it is wound on the end of the beam by means of a winch handle; the next unfolded portion is similarly treated, and the process is continued until the whole length of the warp is properly dealt with.

The loom is of a very simple construction; it consists of four bamboo posts fixed firmly in the ground. They are connected sideways by two rods, which support a few traverse rods, to which the slings of the lay or batten and the balances of the heales are attached. The breast beam or cloth beam has a longitudinal groove in which fits a thin rod carrying all the looped ends of the warp. Both the back and the cloth beam rest upon short bamboo posts, the top part of which has been scooped out in order to form a sort of bearing.

Each beam has a winch handle by means of which each can be turned; the beam is prevented from turning in the opposite direction by means of a stick, one end of which is inserted into the mortise of the beam, while the other end is fixed in the ground. The slay consists of two broad pieces of wood each with longitudinal grooves, into which the reed is received and made fixed by means of iron or wooden pins. It is suspended from the front traverse rod, and in adjusting it properly a good amount of experience and practice is necessary, because the range of its movement determines the degree of force which should be applied to a weft in a particular texture of a fabric. This is considered to be one of the nicest operations in setting this sort of loom. Each heald is equally counter balanced by weights, which are attached to the other ends of the slings, the slings being passed over the traverse rod of the loom frame.

The treadles are made of bamboo or pieces of wood and they are contained in a pit dug in the ground, three by two feet, and one and one-half feet deep. The shuttle, 10 to 14 inches in length and three-fourths of an inch in breadth, weighs about two ounces. It is made of very light wood, and it has two spear-shaped points. Considerable amount of space is provided in its center, which is placed in a movable iron wire longitudinally, upon which the reed of the weft is mounted. The weft is passed through an eye made in the side of the shuttle.

The temple consists of two pieces of wood connected together by cords, their outer ends being armed with iron pins, by means of which the cloth is kept stretched. Every part of the loom being perfectly adjusted, the weaver takes his seat upon a mat or a board placed close to the pit, and depresses one of the treadles, thus forming a shed of about seven-eighths of an inch in depth. The shuttle is then thrown by one hand through the shed with a slight jerk and received by the other on the opposite side; the reed then beats up the shot of weit thus placed. When ten to twelve inches of cloth are woven, lime water is sprinkled over it in order to prevent it from being damaged by insects, and then it is wound upon the cloth beam, and thus simultaneously unwinding a certain length of warp yarn from the back beam. Mustard oil is occasionally applied to the shuttle, reed and slay in order to lessen friction during the process of weaving.

The time taken to weave a muslin twenty yards of cloth one yard in width, can be seen from the following statement by the Commercial Resident: "The preparation of the tana or warp thread of a full piece of plain or striped cloth of the Dacca station employs two men, according to the quality of the thread, from ten to thirty days. The weaving of such cloth employs two persons, one to weave, the other to prepare thread and the loom —if of the ordinary or middling plain assortments, from ten to fifteen days,—if of the fine, twenty days; the superfine, thirty days; the fine superfine, from thirty to forty-five days, and if the cloth be of the fine superfine dooreas or Charkana (checks) assortments, sixty days. A half piece of Mulmulkhas of the finest kind cannot be manufactured in less than five or six months."

Many interesting stories are told concerning the fineness of some of the muslins. The Hindoos amuse themselves with two stories, first that the Emperor Aurangzebe was very angry with his daughter for showing her skin through her clothes, whereupon the young princess remonstrated in her justification that she had seven jamahs or suits on; second, that in Nawab Alliverdy Khan's time a weaver was chastised and turned out of the city of Dacca for his neglect in not preventing his cow from eating up a piece of abrooan, which he had spread and carelessly left on the grass. The very poetic name Shubam—"Evening dew" (as the particular type of muslin was called), suggests that the fabric could scarcely be distinguished from the dew on the grass, when spread over a bleaching field.

Tavernier says in his travels that "a Persian ambassador, on his return from India, presented his king with a cocoanut which contained a muslin turban, thirty yards long, and which when expended in the air could hardly be felt." At the end of the seventeenth century, when De Foe was remonstrating against the admission of the Indian goods into the British Isles, he wrote in his Weekly Review, "Fashion is truly termed a witch, the dearer and scarcer any commodity, the more the mode, thirty shillings a yard for muslins and only the shadow of a commodity when procured."

Dr. James Taylor, the greatest authority on the old fabrics of India, speaking of the fineness of yarn stated thus:

"A skein which a native weaver measured in my presence in 1846 and which was afterwards carefully weighed, proved to be in the proportion of upwards of 250 miles to the pound of cotton. This you allow will come very close to being 525s."

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

A NEW PROCESS OF WEAVING WARP PILE FABRICS

By GIRONDE

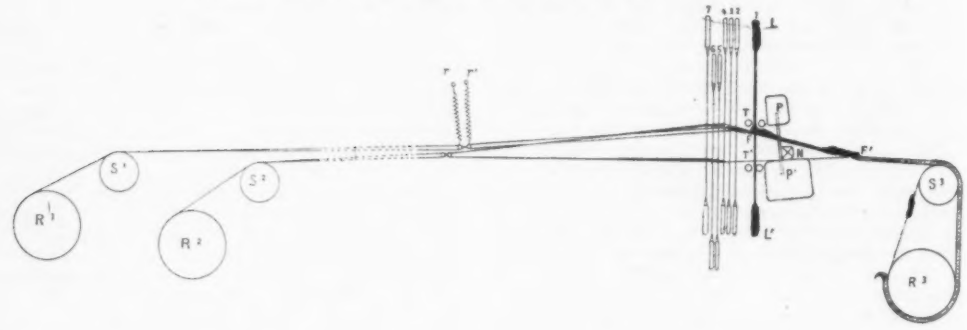
Translated from the French by the Editor of the Textile World Record.

For several months there has been much discussion in trade circles in regard to a new method of weaving warp pile fabrics. The process which is controlled by the Societe francais du Nouveau Velours, 26 Boulevard Bonne-Nouvelle, Paris, possesses the advantage that it can be used on ordinary looms by the use of rods operated by a metal harness, the rods which serve to raise the pile being arranged in the direction of the warp. Following are the French patents exploited by the firm above named:

425,464, P. Girard, Feb. 1, 1911; 440,610, P. Girard, Feb. 26, 1912; 451,775, C. Clemencon, Dec. 11, 1912. A number of additional claims were filed previous to the last of December, 1912.

The accompanying illustrations have been taken from one of the pamphlets published by the inventors. Fig. 1 is a section of a loom equipped with the new device showing the position of the warp threads when the ground pick is inserted in the shed. Fig. 2 is similar to Fig. 1, but shows the position of the warp threads when what is called the "lost" pick is passed through the shed. The steel blades, FF', attached to the metal harness, LL', are inserted in the dents of the reed, PP'. These blades cannot be drawn out of position by the cloth as the metal harness is held rigid by the tubes, TT'. The pile warp is wound on the beam, R', passes over the whip roll, S', through the

FIG 1. A SECTION OF A LOOM EQUIPPED WITH THE NEW PILE DEVICE



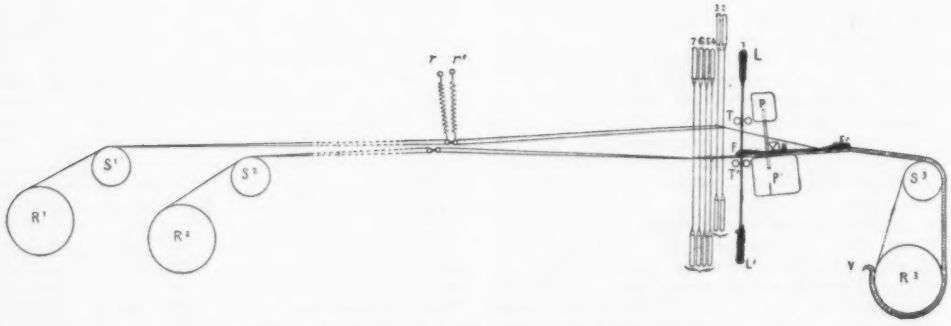
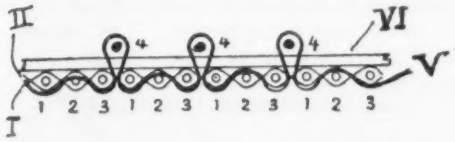


FIG 2. SHOWING THE POSITION OF THE WARP THREADS

lease rods which are equipped with springs, r r', and then to the heddles. The ground warp is wound on the beams, R^2, passes over the whip roll, S^2, and then to the lease rod and heddles. Two or more picks, depending on the pattern, are woven in the ground fabric, during which time the blades

FIG. 3. A LONGITUDINAL SECTION OF THE FABRIC



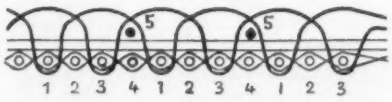
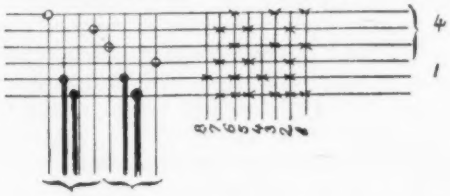


FIG. 4. SHOWING THE CONSTRUCTION

are held in the position shown at Fig. 1. In order to form the loop of the pile, the rods are moved to the position shown at Fig. 2, that is, the blades and the ground warp are lowered, the pile warp alone being raised. As a result the pick which is passed through

FIG. 5. THE DRAWING-IN DRAFT



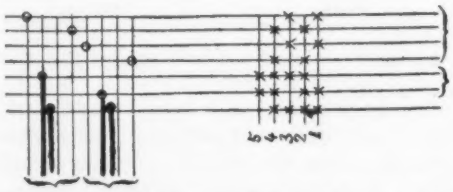


FIG. 6. SHOWING THE CONSTRUCTION OF A PLUSH FABRIC

this shed rests on the blades and thus serves to produce a loop in the pile warp. This is illustrated at Fig. 3, which is a longitudinal section of the fabric, in which 1, 2 and 3 represent the ground picks; 4, the lost pick resting on the blades, VI; I and II the ground warp threads and V the pile warp. As the illustration shows, the ground fabric is woven with a plain weave, the drawing-in draft being shown at Fig. 5. There are placed in each dent of the reed one ground thread, one pile thread, one blade and one ground thread, in the order named. As three ground picks are woven for one lost pick the filling pattern covers eight picks.

Fig. 7 shows one of the blades and the method of attaching it to the heddle. Fig. 8 shows the method of mounting the tubes, TT', which hold the metal harness in position. Fig. 9 shows the metal harness which

FIG. 8. METHOD OF MOUNTING THE TUBES

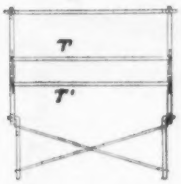


FIG. 9. METAL HARNESS FOR OPERATING THE BLADES

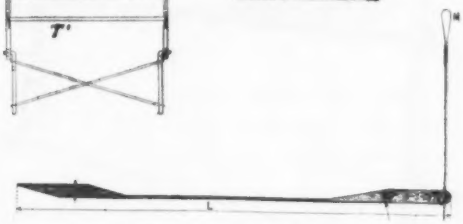


FIG. 7. ONE OF THE BLADES

operates the blades, Fig. 10 shows the complete attachment. As shown at Figs. 1 and 2, the fabric is drawn over the breast beam by the take-up roll, R^3. This roll should be covered with fine steel points to avoid all slipping. Between the rolls, R^3 and S^3, there is an endless cloth apron which serves to strip the fabric from the take-up roll, R^3.

In the fabric illustrated at Figs. 3 and 5 all the pile threads operate at the same time as in the case of ordinary velvet. Figs. 4 and 6 show the construction of a plush fabric, the pile threads being operated alternately. When the first lost pick is inserted the odd numbered threads are raised and when the second lost pick is placed in the shed the even numbered threads are raised. The ground weave being plain, the pattern covers five picks, that is, four for the ground work and one for the pile. The warp threads and blades are set in the reed as in the case of the first named fabric. During weaving the blades project into the fabric

for 5/8 to 7/8 inch, and are withdrawn as the cloth is drawn down by the take-up roll. These blades are made of hard tempered steel having a high polish. As shown at Fig. 7 they are cut down to small dimensions in the center to permit the passage of the shuttle carrying the lost pick. The part projecting toward the cloth is in the form of

FIG. 10. SHOWING THE COMPLETE ATTACHMENT

an inclined plane which serves to raise the lost pick when the reed beats up to the cloth. The size of the blade varies with the fabric and the style of the loom. The total length is determined by the swing of the lay. For silk a length of 9 inches is sufficient, but for other classes of goods the blades are 11 inches long. The blades are at least 7/1000 of an inch thick, which allows from 55 to 60 dents to the inch, but the ordinary thickness is 9/1000 inch, which allows from 35 to 40 dents to the inch. The height is determined by the height of the pile desired and varies from 1/25 to 1/5 inch.

There is practically no interference between the blades and the warp threads, as the yarn works below the blades. When the blades are lowered the ground warp is likewise lowered. Each of the blades is mounted separately on a metal heddle so that they can be easily rearranged or replaced in case of accident. The inventors claim that this method of weaving velvet permits of the use of low priced materials, such as artificial silk and schappe silk, which possess much less strength and elasticity than the ordinary textile materials.

As will be easily understood this new process is adapted only for the loop pile. To get a cut pile it is necessary to subject the cloth to a shearing process which cuts the top of the loops. The process of shearing causes a loss of material which is certainly greater than the waste made by shearing the ordinary velvet to make the pile of uniform height. In the second place it is necessary to remove the lost picks which lie in the loops. This results in an additional loss in addition to the hand labor that is necessary, as the picks when left loose by shearing still cling to the selvage and curl up so that it is impossible to remove them by brushing. When the pile is left in loop form it is evident that the lost picks will remain in the pile adding weight to the fabric. The process known as the "massacre" is used for finishing the loop pile as well as the velvet d'Utrecht. After being taken from the loom, the cloth is subjected to the action of an embossing calender. Some of the loops, according to the design of the rollers, are pressed down. The cloth is then sheared so as to cut the loops that remain standing, transforming that part of the design into a cut velvet. The goods are then immersed in hot water which causes the

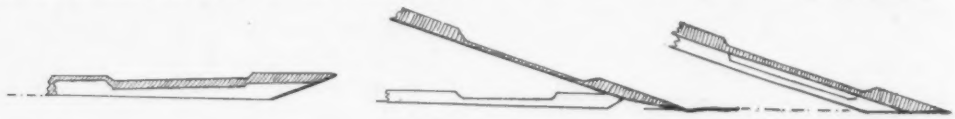


FIG. 11 FIG. 12 FIG. 13

BLADES WHICH FORM THE PILE

loops on the pressed part of the design to rise, producing a pattern formed by a combination of cut and looped piles. As will be easily understood, this method of weaving is suited for fancy velvets woven on a jacquard loom. For this purpose the pile threads, instead of being wound on a single beam, are drawn from independent bobbins set in a frame in the same manner as when weaving the two blades in the position occupied when the lost pick is inserted for the short loop.

Fig. 13 shows both blades raised when the ground fabric is woven. Figs. 14, 15 and 16 are longitudinal sections of three fabrics showing the position of the blades. The filling at Fig. 14 is woven three ground picks and two lost picks. The lost pick used for the high loop passes over both blades, while

FIG. 14. LONGITUDINAL SECTION SHOWING THE POSITION OF THE BLADES

FIG. 15. A MODIFIED SECTION OF FIG. 14

a Wilton carpet. This arrangement enables a pile fabric to be made with the loops of different heights.

After weaving the highest loops are cut. It is necessary to use two sizes of blades, the uneven numbered blades, 9 inches long, being attached to the back metal harness and serving to form the lowest pile. The even numbered blades, which are about 11 inches long, are attached to the front harness and form the highest loop, which is afterwards cut on the shear.

Figs. 11, 12 and 13 show that it is necessary to have blades of different lengths in order that the points may rest on the fabric. Experience has proved that an irregular pile is produced when blades of equal length are used. Only one blade is inserted in each dent of the reed. Fig. 11 shows the two consecutive blades lowered for the passage of the lost pick on which the highest pile is to be formed. This loop is intended to be cut on the shear and is formed by the blade indicated by the shaded line. Fig. 2 shows the lost pick for the short loop passes between the two series of blades. The pattern consists of ten picks, six for the ground and four for the pile. In the sectional view at Fig. 14 the pile warp forming the highest loop rises over the lost pick on which the short loop is formed. This arrangement is modified in Fig. 15, the pile threads of the highest loop being lowered below the lost pick on which the short loop is formed.

FIG. 16. LONGITUDINAL SECTION SHOWING ONE BLADE

This is the only difference between the two.

In the arrangement shown at Fig. 16 the lost picks alternate regularly after two picks in the ground work. As a result the rows of high and low loops will also alternate. From the draft of the ordinary velvet fabric made with the wire motion it is easy to make a pattern to suit the new process. Thus Fig. 17 represents a Crefeld velvet and Fig. 18 gives the same result with the lansettes. The blade is indicated by the second thread which is drawn on the back harness. The new mounting necessitates two more

harness to operate the blades. The movement of the threads remain the same.

The plush draft shown at Fig. 19, which is used for the Girard process, is found at Fig. 20, with two extra harness for the blades. It will thus be seen that the new method requires at least one more harness than for the old style of weaving. The new process has not been in use long enough to warrant speaking definitely regarding its merits and it is necessary to leave it to the test of actual experience in order to determine its value.

FIG. 17

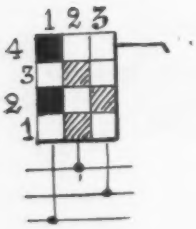
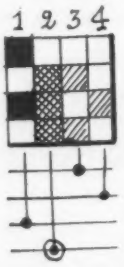


FIG. 18



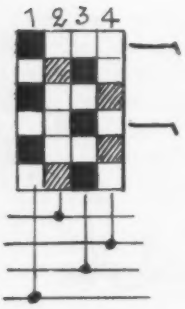


FIG. 19

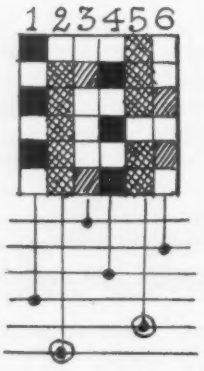


FIG 20

So far only a few looms are running in France and other countries. It is in operation in Bohain and Roubaix for the production of velvet like the three samples enclosed. The one marked A is used exclusively for ladies' wear and is at the present time an extreme novelty. Sample B is a looped pile as it comes from the loom; sample C is the same fabric after shearing. As I have not yet seen whole pieces of velvet made by ths new process it is impossible to form an exact opinion regarding it.

The cost in France of fitting the ordinary Girard loom for the new method of weaving is as follows:

License for duration of patent..	250 francs	$50.00
Royalty per loom	100 francs	20.00
Frame	50 francs	10.00
Metal harness	3 francs	.60
Twenty lansettes	200 francs	40.00
Setting up	25 francs	5.00
	628 francs	$125.60

[The samples, A, B and C, referred to above can be seen at our Boston office.—Ed.]

WOOL SCOURING

BY ROAN

The method of scouring wool employed in modern plants, is far in advance of the primitive process which was in general use a few years ago, and is still found in many of our mills.

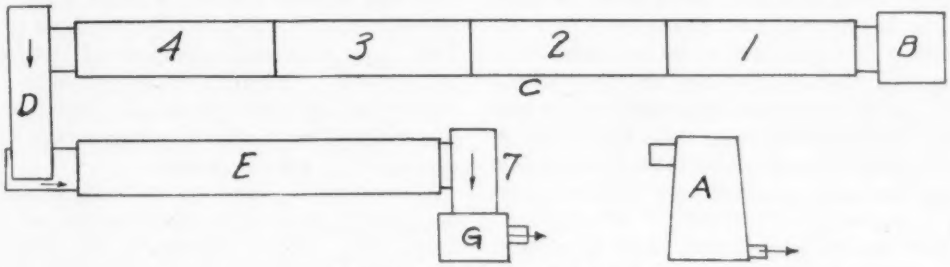
The wool was thrown into a tub containing the scouring liquor and poled for a short time in order to remove the grass and dirt from the fiber, which was then forked out on to a wooden rack to drain, the excess liquor running back into the tub. After draining, the stock was thrown into the rinse box for the final cleansing in cold water. The clean wool was then placed in trucks or on hand barrows to be taken to the dryer.

While this method gave fairly good results, it was slow, laborious and expensive. Unless the attendant used more than ordinary care, the working qualities of the stock were apt to be impaired materially. The poling and forking of the stock, in many instances, rolled and felted it so that it would break in the succeeding processes. It was by no means an unknown occurrence for a lot to be so injured in scouring as to make it of but little more value than shoddy. This system required handling the stock at least eight times, while in a modern scouring room twice is all that is necessary

As the wool comes from the sorting room it contains a considerable amount of impurities in addition to the natural grease or yolk, in the shape of dust, dirt, and shives which may be removed to some extent by mechanical means before scouring. Running the stock through a duster not only removes a portion of the foreign matter ad-

hering to the fiber, but puts the stock into a much better condition for the scouring operation itself. Wool which is well opened and lofty is more readily penetrated by the scouring liquor and will come out cleaner and brighter.

A satisfactory and efficient lay out for the scouring room is shown in the accompanying sketch. Through a trap door in the floor of the sorting room, the wool falls in front of the duster, A, which discharges the stock convenient to the self feed, B, of the four bowl washer, C. From the squeeze



A LAY-OUT FOR A SCOURING ROOM

rolls of the last bowl it is delivered to an apron, D, traveling at right angles to the washer, and inclined to the right so as to drop the stock on the feed apron of the dryer, E. The dry wool is discharged to the apron, F, which travels toward the blower, G, of a pneumatic conveying system, carrying the wool to the bin with a minimum of labor. In actual practice, an installation of this kind will scour from 7,000 to 10,000 lbs. daily with two attendants. During the operations of dusting, scouring, and drying, the stock is handled but twice, once in feeding the duster and again in filling the self feed of the washer.

For scouring wool a supply of clean, soft water is essential, as hard water, particularly that containing salts of lime has a very deleterious effect, more especially if soap is used as the detergent. The soap is decomposed, the grease in it uniting with the acid of the lime salt, forming a lime soap which is insoluble in water and is deposited on the fiber in the form of a sticky paste, completely enveloping the filament and extremely difficult to remove. Moreover, if allowed to remain, it will cause untold difficulties in succeeding operations, especially in dyeing and finishing. Another item that should receive careful attention, is the purity of the scouring materials, not alone for the reason that impure materials may impair the luster, elasticity and working qualities of the fiber, but also to see that an inferior article is not purchased at the price of the best. Since it is easily proven that severe alkalis destroy the natural properties of wool, great care must be taken not to put it in contact with scouring agents that will have a harmful effect. It must always be kept in mind that the highest ambition of the scourer should be to have the stock clean, open, and bright. No detergents should be used which have a tendency to impair its life, luster, elasticity or texture.

It is impossible to give a formula for a scouring liquor which will give the best results under all conditions, owing to the great variation in the quantity of dirt, refuse, and grease contained in various lots. The scourer will have to use his own judgment in order to bring out the stock in the best possible condition. Soap should never be used before testing for free caustic alkali. An extremely easy and accurate test is to place a drop of phenol phthalein on the soap. The presence of free caustic alkali is at once made known by the pink color. For fine wools especially there is no better detergent than a well made potash or crown soap, absolutely free from caustic alkali. This is the so-called "fig soap," deriving its name from the color and the presence of innumerable fine bubbles which gives it a resemblance to the inside of pressed figs.

A very satisfactory scouring liquor can be prepared in this manner. For the first bowl 3 lbs. soap and 6 lbs. urine substitute to 100 gals. of water, for the second bowl 2 lbs. soap and 4 lbs. "sub" per 100 gals. water, the third bowl should have 4 lbs. "sub" and the fourth bowl clear cold water. The temperature should be for the first bowl, 120° to 125° F. for the second, 115° to 120° F. and for the third not over 115° F.

For coarser wools a soda soap in combination with soda compounds may be used, though for wool that is to be used for white effects in the finished goods it is not advisable. Soda is harsher in its action than potash and also has a very strong tendency to turn the wool somewhat yellow, particularly if it is stored some time before using. It is possible to secure very satisfactory results, however, provided care is taken in its use.

For scouring a medium wool the liquor for the first bowl should have 3 lbs. of soap and 10 lbs. of a good soda to 100 gals. of water, temperature 120° to 130° F. The second bowl 2 lbs. soap and 7 1/2 to 8 lbs. soda per 100 gals. water not over 120° F. The third bowl should have 3 to 4 lbs. soda only per 100 gals. water not over 115° F. and the fourth bowl clear cold water.

In scouring for worsted spinning the wool is not rinsed and the last bowl should contain a weak scouring liquor.

The strength of the liquor should be determined to a great extent, by the grade of the wool to be scoured, rather than the apparent grease content. The ideal scouring liquor is the one that will clean the stock with the least materials, and at a low temperature. Harsh detergents and a high temperature are the causes of a great deal of trouble in subsequent operations, not only making poor work, but increasing the waste also.

It is necessary to strengthen the liquor at times by the addition of more soap or soda, and when it becomes too dirty to do good work, draw off the first bowl, change the liquor from the second into the first, adding enough material to make it sufficiently strong and renew the liquor in the second bowl.

There are two distinct classes of impurities in the wool as it comes to the scourer, the foreign matter consisting of dirt, shives, etc. and the yolk. Under this latter term are generally included the wool fat and the "suint" or dried perspiration of the sheep. Both of these can be recovered and are of considerable value. The latter is composed very largely of potash in combination with various organic acids and is readily soluble in warm water. In some countries of Europe the wool is soaked in warm water before scouring in order to dissolve these salts. The liquor obtained is evaporated and from the residue a quantity of potash salts are recovered. By this process in France alone it is claimed they obtain yearly, potash salts worth half a million dollars.

A process of scouring, or more properly, degreasing wool is in use in a few of our large mills. This is known as the "solvent process". While the yolk proper or wool fat is not soluble in water it is readily dissolved by some of the volatile hydro carbons. In this process the wool is treated in large kiers, the naphtha or other solvent drawn out and the wool washed usually in warm water, as there are sufficient potash salts present generally to cleanse it thoroughly. In this system the degras recovered is a marketable product and a source of some revenue. This process leaves the wool in fine condition for working, odorless and a brilliant white. From the fact that it receives so little handling, is not subjected to treatment by alkali nor heat, it is in much better condition than wool scoured in the ordinary way. The solvent process requires an expensive installation of kiers, digesters, pumps, etc., so that the cost would be prohibitory unless there are large quantities of wool to be treated. In cases where the quantity of stock is sufficiently large, the results well repay the expense.

Sisal culture has made great progress in the German colonies, chiefly in East Africa. It is claimed that German sisal is replacing manila hemp in many instances.

ENGLISH NOTES

By Our Regular Correspondent

The question of how tops got their name has been asked without being answered conclusively. There never was any other known name for them and the attitude of manufacturers upon the point is that of the Bradford foreman crabber to whom a clergyman enlarged upon the utter preposterousness of naming so uncrablike a machine a "crab". The foreman desired to know how in Heaven the machine could ever have been given any other name. Tops is not a term free from ambiguity and according to a trade legend a bank director asked a local manager whether the $50,000 advanced to Mr. Smith for tops to spin was not rather a large sum for the indulgence of so puerile a pastime. There is a choice of explanations of the origin of the term, for an Icelandic word "toppr" means tuft or lock of hair; then "tops" has in some senses the same signification as "firsts"; again the tops of the handcombers were from the tops or tips of the teeth of the hand comb and the equally mysteriously named noils were from the bottom of the teeth. Although noil is the only word in use nowadays there are records of an alternative name in "noils or pinions". It is left to guesswork to decide whether the latter arose from the clinging of the short wool around the pins of the comb.

* * *

A small advance in charges for combing has been announced to their customers by the commission woolcombers, all of whom are found within a very short radius of Bradford and are affiliated to one federation of masters. Commission combing is not apparently a bad business for Woolcombers, Ltd., controlling about a score of combing sheds has made some $200,000 net in each of the last three years and has given 11 per cent. upon its common stock. Isaac Holden & Sons, a conservatively managed concern which puts large amounts to reserve made $300,000 and paid 7 per cent. in its last year. The justification for higher charges resides partly in the concession of a scale of wages giving $3.50 minimum to day workers (women) and $6.12 minimum to night workers (men). Night work is somewhat irregular, but as hands are taken on from the union office jobs can be found often in one shed if not in another. The best women comb minders make about $5 in a full week and men about $8. The cost of sickness, insurance and the high price of oils and supplies give further reasons, and as the combers are federated the work cannot be sent elsewhere more cheaply. The spinner can install combs of his own if he likes, and may derive some convenience in so doing, but it is questionable whether any saving is to be made in cost. Apart from the actual combing the commission comber now renders large services in storing wool free until it is wanted and in setting sorting tables and space at the disposal of the customer. The owner of the wool sends his own sorters to the combers' premises and thus avoids costs of rent and of handling. By making it easier for the small capitalist to start in business the commission system of combing has undoubtedly promoted the extension of the English worsted spinning trade. Equally it has freed money for use in buying wool that might otherwise have had to be sunk in small and perhaps inefficient combing plants. Although there is now no competition in price between public combers there is a strong rivalry to obtain work and to keep the machinery upon a full night and day production. The sheds are specialized to deal with wools of a certain range and customers have a choice between rivals.

* * *

Sakel—to Sakelarides, to give its name in full—is a variety of Egyptian cotton known well in Lancashire. It is used in the fine spinning trade for 80s and beyond and also to improve the strength and silkiness of 60s made from lower grade staple. Sakel has the reputation of being better than Jannovitch at its best and it competes effectively with Sea Island. Its position relatively to brown Egyptian and white Egyptian (Jannovitch) is shown by the current Liverpool quotation for:

	Good Fair	F. G. F.
Egyptian Brown	9.50	9.75
Egyptian Nubari	10.15	10.45
Egyptian Jannovitch	10.15	10.50
Egyptian Sakelarides	10.25	10.60

Arno Schmidt in visiting Egypt heard at two ginneries that cultivators like this cotton very much even at the price of best Afifi (Egyptian brown), for they get a 40 per cent. better yield per acre from it. Varieties degenerate in process of time and Sakel is the better thought of because Jannovitch is no longer what it used to be, but at present both in Egypt and in Lancashire Sakel is regarded as the Egyptian best and larger quantities of it are forthcoming.

* * *

A maker of mohair plush tablecloths, mats and curtains requiring to be finished with a fringe points to a matter which has been hitherto overlooked by the inventor. There is no discoverable machine upon the market for binding fringe into groups of threads. Machines for sewing-in and cutting fringe are made by sewing-machine manufacturers, but after the fringe has been made the grouping of the threads into sections, the formation of these into V shapes, and the binding round of these with short ends of yarn at the point of crossing, has to be done by girls who could more productively be employed in other departments. The field before such a machine may be a small one, but in these days of scarce labor manufacturers have an incentive to pay a good price for a machine that will work with little supervision.

* * *

Prolonged opposition was made to the establishment of a regular cotton futures market in Liverpool and perhaps a regular market would never have been formed had not dealings in futures attained so large a scale that the confusion was becoming sericus. The Liverpool Cotton Clearinghouse was opened in 1876, in the early eighties the system of periodical settlements was adopted and ultimately weekly settlements became the rule. Spinners and manufacturers have never liked the intrusion of outsiders and professional operators into the raw cotton market and they are not without sympathy for proposals intended to make the intervention difficult. At the same time there is scepticism as to whether this can be done by any such means as the tax upon futures proposed by Senator Clarke. The proposition requires maturer consideration than has yet been given to it, for no legislation can remove the desire to speculate and it is always probable that gambling will break out in some other form. In India, for example, those inveterate gamblers, the Marwari traders, have devised a method of betting upon "the cotton figure". Given a strong enough interest in the creation of a certain price for cotton all methods are bound to be tried to bring that price into existence. As cotton is not the only, or perhaps even the main, commodity to be treated as a gambling counter it is odd that it alone should be selected for taxation. One school of opinion holds that speculative dealings should be made irrecoverable at law, as sporting bets are in England. In mentioning the fact it is due to add that bookmaking upon races is carried on upon a very considerable scale in despite of this discouragement.

* * *

There was never a serious likelihood that British textile manufacturers would participate largely in the Panama Exposition. New York, not San Francisco, is their vantage ground in American dealings and their samples and salesmen are in all the Latin-American countries. Beyond these facts manufacturers feel that exhibitions are not of very much use to them and that in any case international expositions are overdone. A display of samples has no interest whatever to the ordinary visitor to these amusement parks and a display of tableaux and robed figures is an expensive one for individual manufacturers to make and when undertaken collectively by a number of manufacturers direct results are somewhat difficult to trace. It has been no easy thing for Chambers of Commerce to raise the funds to cover the cost of some relatively inexpensive collective exhibits made in European countries. Unlike machines, fabrics lend themselves readily to private display. Tex-

tile machine makers for the present are more favorably disposed to expositions held in textile than in non-textile centers and the proximity of the Belgian linen and cotton and the French woolen industries attracted some of them this year to Ghent. As a new Manchester exhibition is in prospect other makers may be tempted to save their energies for this. In the Manchester Exposition of 1887 one great Oldham firm which set up a complete outfit of machinery for converting cotton into yarn, found the cost of operation a dismaying one when conducted even thus close at home. Machine makers' profits have not been large lately and this fact is remembered when proposals involving new expense are broached.

The onslaught of Senator Hollis upon the textile manufacturers of New England bears a remarkable resemblance to the wild charges brought at different dates against manufacturers here, but the accusers in this country have ordinarily been labor politicians whose stings have now been effectively drawn. It used to be said that Yorkshire millowners and employers monopolized the administration of justice, but now there are Labor magistrates in all industrial districts and one Huddersfield magnate sits upon the same magnificent bench as two weavers from his own mill. Manufacturers were blamed also for securing favors in taxes by their weight of numbers upon the municipal councils, but now the cry is that able business men refuse to join the town councils. They also were said to procure the use of military in time of strikes, but under the new dispensation this employment of soldiers is officially discouraged. In this country it is not a sin to obtain a trader's contract ticket at reduced rates from a railway company and every consigner of goods paying $1,500 a year or so in freight enjoys this privilege. The favor is one of the exceedingly few that have been left to traders now that the railway companies are all closely united to give the minimum of service at the maximum of charge.

* * *

Marine Fibres & Yarns, Limited, the company formed to market Poseidonia Australis found on the sea floor off the South Australian coast has gone into compulsory liquidation. The association of this company with a German concern founded to manufacture paper yarn dissipated half the capital and the foundering of the dredger by which the weed was raised to the pontoons has completed its misfortunes. The loss to the shareholders is put at $400,000 and it seems hardly possible that the undertaking can be revived. Several syndicates were successively concerned in the exploitation of the weed and the anticipations of the promoters were never widely shared by manufacturers.

* * *

A manufacturer who is the inventor of numerous small improvements in weaving has propounded an addition to the patent law. He would have inspectors appointed with powers of search to visit factories on behalf of patentees and report whether or not use was being made of infringing mechanism. The inspector would act upon receipt of a demand and a covering fee of $5. This is not the proposal that is being made by the Manchester Chamber of Commerce for the better working of that section of the 1907 Patents Act which requires foreign patentees to manufacture in this country or forfeit their patent rights. At present the onus is upon the challenger to prove that a machine patented here is not being manufactured here and in some circumstances proof is difficult. It is therefore proposed that the onus shall be upon the patentee and that it shall suffice for the challenger to make affidavit of his own belief that the manufacture is not conducted in this country. In any case a considerable time is likely to elapse before a change can be made in the existing law. The significance of the proposal is that it comes from Manchester, where opinion has not been uniformly favorable to the Lloyd George Patent Act with its Protectionist implications.

* * *

Notice has been taken in Lancashire of Edward Farnham Greene's statement upon the extent of the sales of cotton goods made by his company in Great Britain, Germany

and France; and of his explanation that the sales have been made at large expense. Cotton crapes resembling "Serpentine" have been fairly popular this season and it may be that others have reaped what the Pacific Mills have sown. At all events the American crapes were marketed at a price which left English makers ample margin for competition and were pretty extensively advertised. The result has apparently been less satisfactory than in the case of Holeproof cotton hosiery, which has become a standard article of drapers' stocks, or the Arrow collars. These are the two American specialties most conspicuous in English trade and their position owes nearly everything to clever merchandising and advertisement.

THE MANUFACTURE OF ELASTIC FABRICS

BY SAMUEL BROWN

In the suspender branch of elastic web weaving, the field of operation is subject to more variety of texture and greater elaboration in fancy effect than in any other section of the business. The range of widths in which such goods are made varies from 1 1/8 to 2 inches, but the widths generally used are from 1 1/8 and 1 3/8 inches. While the single cloth weave, the general features of which we have already described for garters, has of late been extensively used for suspender webs, the double cloth weave is considered the standard for such goods. This double weave consists of two distinct cloths, one of which is designed for the face of the fabric, and the other for the back. The two cloths are bound together by a separate warp known as the binder, which is interwoven in the other two fabrics. The face and back weaves may be, and generally are entirely different, either in the character of the weave, or the fineness of the texture. While the back is usually made plain and coarser than the face, a great variety of weaves and weave patterns may be used for the face.

The selvage of these goods is made with a distinct warp, so woven that it will produce

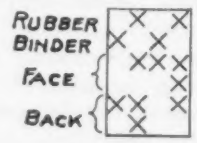


FIG. 45

an independent section of cloth going completely around the outside rubbers. It is in fact a combination of face and back weave not intersected with any binder warp thread, and woven into a perfect tube around the edge rubber. The weave usually used in the selvage is plain on both face and back, making what is known as the "round edge". Twill edges are sometimes used and occasionally a combination of twill on the face side and plain on the back side. In any case

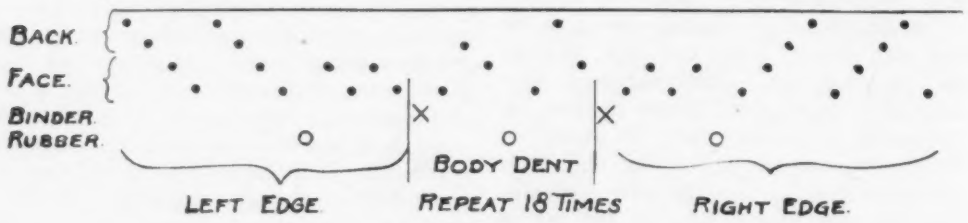


FIG. 44

the edge forms one of the most important features of the goods. As these goods are usually marketed in the roll, it is essential that the selvage be perfect.

It is almost imperative that the different sections of these goods be warped separately. Either the yarn which is used in the various warps is very different in character and size, or the weaves are so varied as regards take up that it is not possible to weave them satisfactorily if warped. Separate warps are required for the face, back, gut, edge, and binder, and also for any additional warp needed for figure effects.

In designing the structure and weaves of a double cloth fabric, we have first to consider the balance in the finished goods. Should the stock used in the face and back not balance perfectly in weight, the heavier side will preponderate over the lighter side when the contraction of the web takes place, and the goods will curl around, producing the same uncontrollable effect as an unbalanced figure would cause on a single cloth garter web, and which was described in the last article. The same condition will also result should one side of the web be more closely stitched than the other side, unless compensation is made for such variation, either in the size of the yarn or in the relative number of threads per inch. If for example a plain weave is used on the face with 4 threads of 2/40s to the dent, there must be the same amount to balance the back, say 2 threads of 2/20s. If a loose twill weave is used on the face, with 4 threads of 2/40s to the dent, and the same amount of stock is used in a tighter weave for the back, the goods will curl out of shape after leaving the press roll when contraction takes place.

It becomes necessary, therefore, either to use lighter stock for the back, or heavier stock for the face; or to increase the number of face threads, in order to compensate for the loose weave. This question of balance has to be considered in every possible variety of double cloth web. Any added features of elaboration, or the introduction of new weaves may create conditions which interfere with the balance of the goods.

Contraction also introduces a difficulty in the lay of the web at the selvage, which it is often hard to control. Too much stock or too many threads may retard contraction and produce a filling of the goods. The reverse conditions may allow the edge rubber threads to contract too much and the result will be a "bellying" of the goods. All these conditions must be carefully studied in the construction of the web in order to get satisfactory results.

Fig. 44 shows the harness draft of the simplest form of double cloth, having a plain weave on both face and back, and extending over a web with 18 body cords, besides the selvage. The rubber is drawn on the front harness, the binder on the 2nd, the face on the 3rd and 4th and the back on the 5th and 6th.

The chain draft is shown in Fig. 45. Following are the warp counts of such a web properly balanced and the reed count to make the goods 1 1/8 inches wide.

Face 72 ends	2/40s
Edge 25 ends	2/40s
Back 36 ends	2/20s
Gut 18 ends	2/20s
Binder 19 ends	2/16s
Rubber 20 ends	38s
Filling	3/30s
Reed	17 dent

The first 4 threads each side of the edge and next to the body are drawn on the face harness, and not alternated with the back harness threads as the rest of the selvage threads are. This arrangement is made in order to correct any liability of the filling grinning through, and to improve the appearance of the face at this point, where a slightly slack filling would cause it to open up. There is one extra thread on the front harness at the right hand side of the edge, which is put there to produce a complete weave, otherwise it would have the appearance of a double thread at this point when the finished goods are rolled up. It is further designed in this weave to let the shuttle travel through the shed from right to left when the rubber harness is up, and from left to right when the binder harness is up. Otherwise should the shuttle be set to travel the opposite way, this double thread effect would again be in evidence.

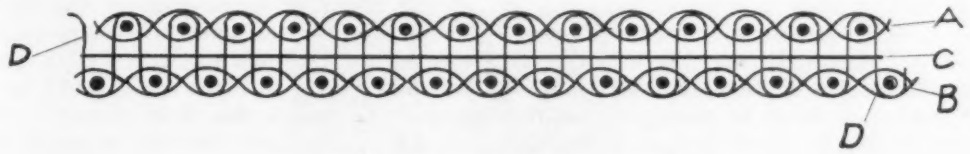


FIG. 46. A LONGITUDINAL SECTION OF THE WEB

The gut warp is usually drawn in the same harness eye with the body rubber threads. When a plain weave is used, it may be evenly distributed across the web, but in fancy effects, it may become necessary to distribute it to meet any irregularities that may arise from the introduction of blocks of figure threads. Both the face, back and gut warps may be weighted to obtain good clearance in the front shed, but the weighting of the edge warp is made to suit the tension necessary to apply to the filling. Too little weight will give the filling yarn power to nip the edge, so that it hugs the body tightly, and this will stop contraction of the edge rubber, causing frilling of the goods. Under such circumstances it will also be difficult to keep the edge rubber from breaking at the reed, as the increased tension of the filling nips the edge rubber in towards the body, and it is liable to be chopped off by the sharp edge of the dent, or gradually chafed to the breaking point by the constant breaking of the reed at the angle created by this nipping-in process.

If the edge warp is weighted too heavy, it will cause the threads to spread in the front reed, and thus make the tube in which the edge rubber lies so large that an excessive contraction is liable to take place at this point, causing the goods to belly. The edge being drawn in 2, and sometimes 3 dents, if overweighted will open it up, and produce an unsatisfactory seersucker appearance in the finished goods, when they are put up in the roll.

It is in the weighting of the binder warps that the greatest change occurs in the character of the goods. Fig. 46 shows a longitudinal section of the web, indicating Figs. 44 and 45. The face threads are shown at A; the back threads, at B; and the rubber, at C, between the two. The binder thread, D, passes up and down and thus stitches the fabrics together. If the binder warp is allowed to run loose between the upper and lower cloths it will leave more space for the rubber thread. It will thus have more power to contract the goods than if weight were added to the binder warp, which would straighten out the thread, and have a tendency to nip the two cloths together, closing up the distance between them, and binding the rubber, so as to interfere with the power of contraction. It is necessary to use great care in regulating this weight, as a slight difference will materially change the value of the goods. Added weight will both retard contraction and thin the goods, thus reducing the value. Fig. 46 shows that any change in the size of the yarn used for the binder will have considerable effect on the weight of the goods, and also on the length of stretch. Fig. 46 also illustrates how the adding of any gut stock, which runs in the same cavity with the rubber thread, will by filling up this cavity, reduce to a certain extent the power of the rubber to contract the goods.

While the body rubber threads come down from the harness, through the front reed openings into the fabric at the breastpiece in a perfectly straight line, so that there is little or no friction on these threads, the edge rubber and edge warp threads are pulled against the side of the dents by the action of the filling at every beat of the reed. These edge threads stand at a sharp angle between the reed and the woven cloth, and are thus subject to much friction and hard usage. To reduce this, it is customary to set the outside reed dents at an angle, so that the strain will not be as great. This is done by putting a little twist in the dents both at the top and bottom, with a pair of smooth flat nosed reed pliers, or by using a specially made reed set.

I have explained the necessity of having separate warps for the different sections. It is also necessary to have these warps arranged to run under different back rolls, for convenience in separating the threads, and to expedite the handling of the same, and more important still, to give the different weaves perfect freedom of operation. The same character of weaves should be kept together, as far as possible. Three back rolls are generally used. The face and edge might be put under the front roller; the binder, which comes down fast and is weighted very light, under the middle one, and the back warp and gut under the back

roller. Perhaps at this point it might be well to refer to the necessity of making adequate provision to avoid any slipping at the press roll. The aggregate weight carried on the various sections of warp, together with the necessary tension on the rubber warp creates a great strain on the goods, and it becomes necessary to prevent them slipping back. Should this occur, the result is not only loss of stretch, but increased difficulty in keeping the edge rubbers from breaking at the reed. Very heavy iron hanging rolls or adjustable screw clamp rolls are necessary over the main press rolls. There should not be any neglect in keeping these rolls well covered with a sand paper suitable to the grade of goods being made.

A HAND BOOK OF WEAVES

By G. H. Oelsner, Director of the Weaving School at Werdau.

Translated and Revised by Samuel S. Dale

This Series began in July, 1911

A heavier fabric can be obtained with Fig. 1270 than with either Fig. 1268 or Fig. 1269, as the back filling in Fig. 1270 is stitched but once in six threads instead of every third thread.

As both Figs. 1271 and 1272 are woven with a plain weave on the face, rule 3, already given, cannot be followed. These weaves are in common use.

When a warp thread passes below and stitches a back pick, it should also lie below

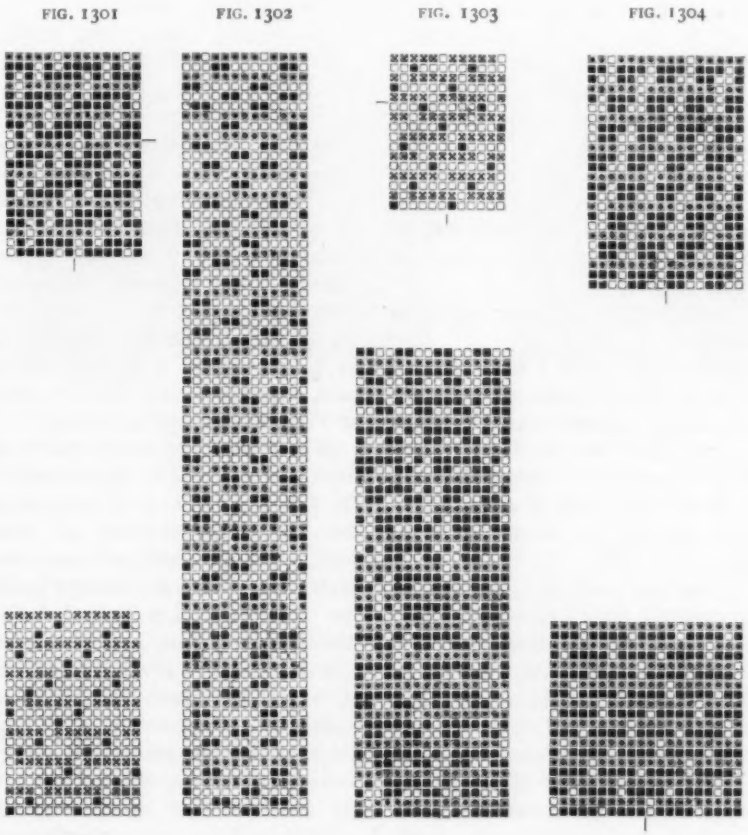


FIG. 1301 FIG. 1302 FIG. 1303 FIG. 1304

FIG. 1305 FIG. 1306 FIG. 1307

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the preceding face pick. For example, in Fig. 1271 thread 4, which stitches pick 2 (back) is below pick 1 (face). A fabric can be made much heavier with either Fig. 1275 or Fig. 1276, in which the back filling is stitched every eighth thread, than if woven with Fig. 1274, in which the back filling is stitched every fourth thread. These three double weaves have the same weave, a 4-leaf twill, on the face. When, however, the back filling weave covers twice as many warp threads as the face weave the back stitchers must be brought on alternate face twills in order to prevent them from affecting the appearance of the face. If the back stitchers are all brought on the same face twill, this twill will appear flatter and narrower than the other twill under which the back picks float without stitchers.

Fig. 1275 shows all the back stitchers on the same twill line, producing an uneven face, while in Fig. 1276 the face twills will be alike because the back stitchers come on alternate twills.

Fig. 1289 is also arranged, like 1276, to give a smooth face.

The arrangement of 1 face 2 back, shown at Fig. 1290 is for the purpose of reducing the cost of the fabric, cheaper material being used for the back than for the face. Back filling cloths are sometimes made firmer by stitching the back filling two or more times in each weave pattern, as shown at Figs. 1281 and 1282.

Fig. 1280 shows the back pick stitched by being raised above two adjacent warp threads. This method is admissible for weaves with long floats, but the contrast in color or quality between the face and back should not be too sharp.

Fig. 1283 gives a very firm fabric. As the filling is woven 1 face 1 back the yarn on the back and face must be about the same size. This weave is well adapted for a close finish on woolen fabrics. In fancy patterns 2 adjacent threads of one color in the warp are required to balance 1 face thread of the same color in the filling. Plain silk mixtures are often made with this weave. The warp and back filling are usually black, the face filling being all 2-ply made of 1 single black 1 organzine silk. Fig. 1283 is Fig. 1243 turned one-quarter round to transpose the warp and filling.

Fig. 1283 may be used for a cotton warp frieze, the warp being hid by both face and back. The use of cotton warp for friezes is of doubtful economy owing to the necessity of increasing the number of picks to obtain the required weight. A cotton warp frieze woven with Fig. 1283 can be striped in the warp by weaving the fancy woolen warp on an extra harness in 5 up 3 down broken twill order.

Fig. 1293 may be used for cotton warp piece dyed chinchillas.

Figs. 1283, 1284, 1285, 1286, 1287, 1288, 1291, 1292, 1293, 1303 and 1305 are weaves in which the filling predominates on the surface of both face and back, the warp being covered. Such weaves are often used for cheap fabrics in which the warp is cotton yarn and the filling medium wool or shoddy. If the filling is made of shoddy, and, therefore, spun to a coarse count, the 1 and 1 or 2 and 2 order is usually changed to 2 face 1 back in order to obtain a good appearance on the face. The face weave is arranged so as to permit of a regular stitching of the back filling. Three such weaves are shown at Figs. 1291, 1292 and 1293.

When cloth in which the warp predominates on the face is woven with back filling, the latter must float at least twice as far as the face filling and be so interlaced that stitchers shall come on every twill line. In such weaves it is not always possible to have the stitching warp thread below the face thread both before and after the back pick.

This difficulty is illustrated at Fig. 1307, in which the warp thread that stitches a back pick is below the preceding face pick, but above the succeeding face pick. If, however, the face weave is a double satin, the stitchers can be inserted so that the warp thread lies below the face pick on each side of the stitched back pick, Figs. 1295 and 1301.

For fine stripes a 3-leaf twill, pointed in the filling, is used, with the face picks stitched successively on warp threads, 1, 2, 3, 2, Fig. 639. Fig. 1296 shows such a weave with the back filling stitched only on warp threads, 1, 3, 4, 6. The absence of

back stitchers on warp threads 2 and 5 does not cause irregularity of tension because these two threads are woven plain and thus interlace the face filling more closely than the other warp threads, which are woven 1 up 2 down.

It is evident from Fig. 1296 that the face of back filling weaves need not be regular twills or satins. Most weaves are suited for the face of back filling fabrics, especially those weaves in which the warp passes below two successive filling threads.

Fig. 1314 shows the crepe weave, Fig. 1311, with each back pick woven 9 up 1 down 5 up 1 down.

Figs. 1302 and 1315 are often used for fine worsteds. The twill form in which the back picks are stitched causes a diagonal break or recess on the face.

Figs. 1306, 1313 and 1316 are used for military diagonals and cloth for riding breeches.

Fig. 1306 is woven 1 face, 1 stuffing pick, 1 back.

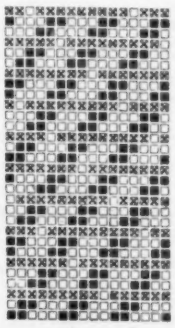

FIG. 1308

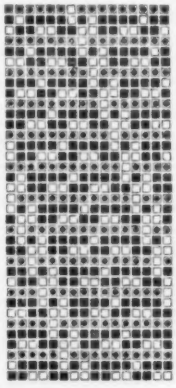

FIG. 1309

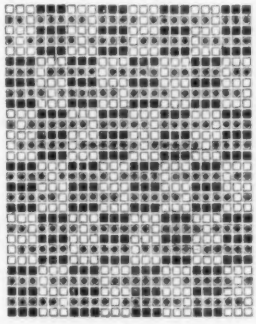

FIG. 1310

Fig. 1297 is a broken 2 up 2 down twill, Fig. 382, on the face, with a broken 3 up 1 down twill on the back. Fig. 1294 is a corkscrew, Fig. 457, on the face, with a 9-leaf back weave. Fig. 1298 is a dovetail twill, Fig. 510, on the face with a 9-leaf back weave. All three are suitable for heavy goods.

Two back picks can be inserted between each face pick. In such a case one back pick passes below the other and floats twice as far. Fig. 1304 shows such a weave in which one back pick, stitched with an 8-leaf satin, passes under the other back pick, which is stitched with a 3 up 1 down twill, the face weave being a 2 up 2 down twill.

Fig. 1309 shows the diagonal, Fig. 326, woven with back filling. This weave can be designated as 2 face 1 back or 1 face 1 stuffing pick 1 back.

In Fig. 1310 each warp thread stitches the back picks twice in the filling pattern and once in the warp pattern. The face is a 4-leaf basket. The filling is woven 1 face, 1 back, 1 face, 1 back, 1 face.

Fig. 1313, 1 face, 1 back.

Fig. 1316, 2 face, 1 back.

A diagonal recess is obtained by stitching the back picks as shown at Figs. 1299 and 1300.

A familiarity with the construction of back filling fabrics is important, especially when dissecting such cloths which may have been fulled hard.

When drafting weaves in which it is difficult to stitch the back picks regularly, the stitchers are arranged to conform to the face weave. For this purpose a space is left between each two face picks, and on each of these lines risers are marked where the back pick should be stitched. The face weave is then drafted so that as many of the back stitches as possible may come where the warp is below both the preceding and succeeding picks. The remaining stitches are then rearranged to effect the same result while disturbing the regular order as little as possible.

Fig. 1302, woven 3 face, 1 back, 1 face, 1 back.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

A WATERPROOF COTTON FABRIC

Editor Textile World Record:

The enclosed sample is coated with gutta percha. It can be used for backing and strengthening leather. It can also be used for mending tears or holes in cloth or other articles. The hot iron dissolves the gutta percha coating and makes it stick readily to cloth or leather. Can you tell me where I can get a thin, smooth waterproof fabric that has been squared down to the thickness of tracing cloth, say 340 thicknesses to the inch? Tracing cloth cannot be used because it is not waterproof. Cloth made by Menzie's patent might prove suitable for this purpose. Menzie's patent is No. 12807, patented in 1902. There are a number of fabrics besides the Menzie cloth on the English market that would no doubt prove entirely satisfactory. Praxiteles (2180).

Our English correspondent replies as follows:

An English expert of long practical experience in waterproofing cotton goods dismisses the suggestion that any treatment founded on use of wax and acetate of alumina would render the fabric sufficiently impervious for the purpose. Menzie's process consists in impregnating the goods with stearic and oleic acid with caustic potash in a steam-jacketed vessel and then adding silicate of soda and paraffin wax. Treatment in a bath of acetate of alum follows and the goods are then dried. The idea that cloth so prepared will not answer is based on the supposition that the inquirer wants a cloth so impermeable that the solvent used in applying the gutta percha will not penetrate the fabric.

The advice to "viscose" the cloth by running it through zinc chloride at about 70° Tw., has been given from one quarter. The solution is syrupy at this strength and the subsequent drying has to be done at a low temperature or the coating will blacken. It would probably be necessary to let the cloth dry in the air.

A sample is sent of a special fabric called Pluvinsin and made by a branch of the Winterbottom Book Cloth Co., Ltd., Manchester, England—manufacturers of tracing cloth. The cloth is brown in color and coated on one side with a waterproof composition which is probably celluloid in mixture with an essential oil used to keep the fabric limp. Pluvinsin is quite waterproof and the gutta percha might be applied to the back. James Stead.

SHRINKAGE OF COTTON DURING MERCERIZING

Editor Textile World Record:

Please state how much cotton yarn shrinks in weight during the process of mercerizing.

Maxwell (2200).

The shrinkage in mercerization differs according to the grade of yarn, but an average in a large mercerizing plant for a period of many months was just 6 per cent.

Seminole.

Before mercerizing, cotton yarn should be freed from gummy impurities, which have a tendency to prevent the absorption of the caustic liquor by the fibers. The loss resulting from this cleansing process depends upon the condition of the cotton and should not exceed 5 per cent. Jute, on the other hand, which has a cellulose base, loses about 30 per cent. of its weight in mercerizing. It is not the caustic soda that causes the loss of weight; it is the preliminary cleansing of the cotton. This cleansing process can be dispensed with and the loss thus prevented. For this purpose a small quantity of petroleum is added to the caustic liquor, this addition causing an immediate impregnation of the yarn. This method, which is used only in England, has the disadvantage of imparting an objectionable odor to the yarn

Gaul.

ELECTRIC CURRENT FROM STEAM POWER

Editor Textile World Record:

I would like information relative to the cost of producing electric current from steam power in comparison with the cost of the regular steam drive which we are using. We have an 80-horse boiler and a 50 horse power engine. Will this equipment be necessary to furnish enough electric current to generate 45 horse power? Please advise us as to the cost of a horse power per hour, figuring coal on a basis of $3 per ton.

Is this method of producing electricity practical for mills that are not in the regular coal districts?

Wales (2146).

The question is not specific enough to allow of an accurate answer without assuming certain points. The steam consumption of engine will be assumed at 30 lbs. per i. h. p., which equals 33 lbs. per b. h. p., or 44 lbs. per kilowatt hour. Boiler evaporation will be assumed at 8 lbs. water to 1 lb. of coal, and $3.00 per ton as cost of 2,240 lbs. or long ton.

Using these figures we arrive at cost of coal as follows:

30 lbs. steam per i. h. p. = 37.5 lbs. coal = .005c.

33 lbs. steam per b. h. p. = 4.125 lbs. coal = .0055c.

44 lbs. steam per k. w. = 5.5 lbs. coal = .0073c.

The i. h. p. figures are given as steam engine guarantees and are invariably given in i. h. p. terms by manufacturers.

The capacities given of 45 h. p. and 50 h. p. are so near alike that above figures can be used for both conditions.

No addition has been made for stand-by losses such as banking fires, oil, waste, etc., as it would be practically the same for steam engine for belt transmission service as for steam engine directly connected to electric generator. Nothing has been changed for labor, interest on plant investment, taxes or depreciation.

Assuming that the 45 h. p. generated electrically is the amount required at driven machinery, then the actual h. p. required from the steam engine would be 70, or 77 i. h. p. This result is obtained by making ordinary allowance for losses in changing from mechanical to electrical power in the generator and back again to mechanical power through motors, as well as certain losses in transmitting current between generator and motors. The generator under this basis of figuring would be 45 k. w.

In small power applications of this kind with driven machinery well grouped so that long, heavy belts can be avoided, and the driving power applied at a fairly central point, it is generally found that a good grade of steam engine with belt transmission is more economical than the electric motor drive. This statement is open to criticism and under certain conditions would not be true, but in the average case, particularly where existing plants are laid out and equipped for belt or mechanical transmission, the mechanical drive will be found more efficient.

The cost of operating a plant of this size is difficult to estimate without having full particulars, but as an approximate cost including fuel, oil, labor, interest, depreciation, taxes, etc., we would put this at .026 per brake horse power hour, or .035 per kilowatt hour.

Morrill.

PRODUCTION OF MULES AND LOOMS

Editor Textile World Record:

We are running 9 broad looms, 96 picks per minute on goods like the enclosed sample, which are made with 2240 ends in the warp and 30 picks in the filling. We have two Davis & Furber mules of 288 spindles each and one Johnson & Bassett mule. The Davis & Furber machine is running 3 draws per minute; the Johnson & Bassett, 2 1/7 draws per minute. The spinner has a boy on each mule, but cannot keep the looms running. I would like to know if we have enough spindles for our looms. Also please inform me how fast mules of this size should run.

Modoc (2190).

At the speed stated by "Modoc" three mules with 816 spindles would give a theoretical production of 4,484 yards of yarn per minute, that is, without allowing for any stopping of the machines, the calculation being as follows:

	Draws per min.
576 (sp.) × 3 (draws)	= 1,728
240 (sp.) × 2 1/7 (draws)	= 514
	2,242

2,242 draws = 4,484 yds. of yarn per minute.

Allowing for waste and take-up, one yard of the fabric made by "Modoc" would re-

quire 4,785 yards of yarn per minute as it comes from the mule. A loom running 96 picks per minute on the same cloth shows a theoretical production of 3.2 inches per minute, or 28.8 inches (.8 yd.) per minute from 9 looms. This would be equivalent to a consumption of (4,785 × .8) 3,828 yards of yarn per minute.

The theoretical production of the three mules is 4.484 yards of yarn per minute as compared with a theoretical consumption of 3,828 yards of yarn per minute by the nine looms. If in practice the mules do not supply yarn to keep the looms running, that fact is proof that the loss of time is greater on the mules than on the looms. "Modoc" should investigate the question of lost time on the mules. If he finds that after reducing it to a minimum they do not keep up with the looms, the remedy is to add another mule to the plant.

TWIST IN PLY YARN

Editor Textile World Record:

Please give a practical or theoretical rule for finding the number of turns of twist to put into a cotton ply yarn to get the balance twist, the turns of twist in the single and the number of the yarn in the single being known? Please explain how to calculate the required for a cabled cotton yarn to get the balance twist in the finished ply?

Jasper (2183).

The varied conditions of twist in yarns is a subject little understood. In text-books, for example, the rule for "relative twist" is usually given as follows:

Rule: Change the turns per inch in proportion to the diameters (square root of yarn count), of the respective yarns.

Example: A 2/32s worsted has proved satisfactory with 12 turns per inch. What will be the relative twist for a 2/50s yarn?

As $\sqrt{(16)} : \sqrt{(25)} :: 12 : x$, or

As $\sqrt{(4)} : \sqrt{(5)} :: 12 : x = 15$ turns per inch for 2/50s yarn.

This rule does not really give relative twist; it gives the turns to maintain the same external fiber or twist angle. Probably a truer relative twist is maintained by changing directly in proportion to the counts, viz.:

As $16 : 25 :: 12 : x = 18.7$ turns per inch for 2/50s yarn.

The yarn constructor will vary the twist (preferably "angle of twist" as explained in the February, 1913, issue in accordance with the requirements of the particular case in hand.

Balance twist is equally difficult to follow, but may be said to be based upon this fact: If a single thread is twisted with say 12 turns per inch and allowed to twofold itself, that is, to kink-up, the twofold thread will be found to have 6 turns per inch. Thus it is evident that under natural conditions yarns tend to take twist directly in proportion to their areas or counts and not according to their diameters, square root of count. If three strands are allowed to kink-up, 4 turns per inch will be noted; and four strands give 3 turns per inch. Balance twist must be based upon this fundamental fact which may be so simply proved. If 24 turns are put into a yarn, upon twofolding this yarn 12 turns per inch will be necessary, and if fourfolding it 6 turns per inch will be necessary. A fourfold yarn may be considered as composed of four units or of two units of two units, under which circumstances the turns per inch might vary. The subject is full of interest and these notes can only serve as an introduction to a more complete investigation.

Aldred F. Barker.

WATERPROOFING RAMIE

Editor Textile World Record:

We enclose a sample of ramie fiber strip made from a ramie fiber and stiffened by a solution of gelatine. We wish to waterproof this material. Any information you can give us on this subject will be appreciated. Ramie (2098).

As this ramie fiber has a gelatine finish it will have a certain amount of resistance to water as it is, but the showerproofing effect could be greatly increased by adopting the chromide of gelatine process. This is effected by adding from 3 to 5 per cent. bichrome to the gelatine dressing, but the drawback is that this has to be done in the dark, and the dressing also used in the dark as the chromide is produced by the action of sunlight. A solution of pure tannic acid or formalin would also give a showerproofing effect. Culebra.

FINISHING JERSEY CLOTH

Editor Textile World Record:

We would like some information regarding the handling of Jersey cloth from the time it leaves the knitting machines until it is ready to cut. This

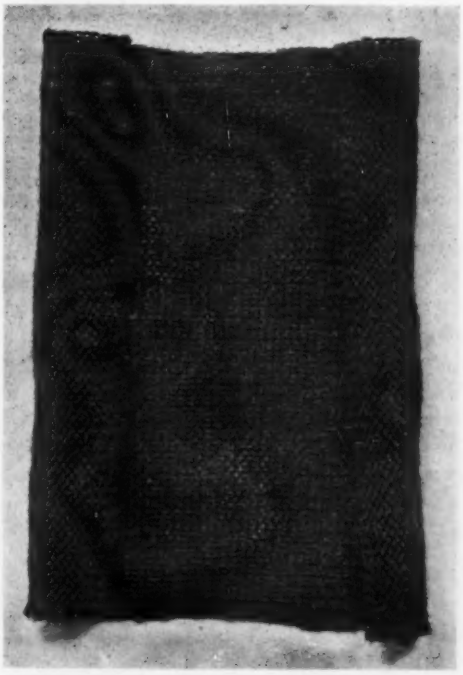

FIG. 1. JERSEY CLOTH WITH ROLLED EDGES

cloth is made into sweaters. We are having difficulty with the cloth rolling up, as shown at Fig. 1.
Weymouth (2154).

Jersey cloth was extensively manufactured from 1883 to 1891 in Philadelphia and also in eastern mills, but not in the knitting mill districts of Cohoes and Amsterdam. In some of the Philadelphia mills this cloth was made on flat knitting machines similar to a loom, but in the eastern mills it was made on spring needle circular knitting machine of the Tompkins, Campbell & Clute, and Crane types. Several of the smaller manufacturers of jersey cloth sent it to the dyers and finishers in Philadelphia to be finished ready for the market. Jersey cloth is finished in about the same manner as woven cloths, such as tweeds, dress goods, etc. The knitted cloth was made on cylinders of large diameter, that is, 28 and 30 inches, on which were 6 and 8 feeds, 24, 27 and 30 gauge, using a good quality of worsted yarn, 2 threads of 1/40s or 1/45s worsted number. Most of this yarn was imported from France and Germany.

The large cylinders were used so that the cloth would measure 50 to 54 inches wide when finished, like the general run of woven cloths in width.

FIG. 2

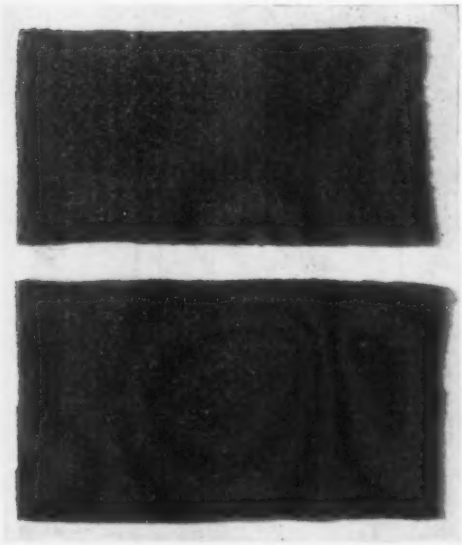

FIG. 3. FANCY STITCHES FOR JERSEY CLOTHS

Figs. 2 and 3 are samples of fancy stitch jersey cloth. Fig. 2 is a polka dot effect, using a mohair worsted yarn for the tuck presser feed, 2 and 1, which produces the dot so that it appears like a silk and worsted jersey cloth when dyed black and finished.

Fig. 3 is made with a 2 and 2 tuck presser repeated 3 times, making 12 stitches, then 12 plain stitches, making a total of 24 stitches. The number of needles in the cylinder should be a multiple of 24. The 2 and 2 tuck presser of the second feed is set to press off the loops the first feed presser had tucked. Lafayette.

The enclosed samples look very much as if they were made on a bathing suit machine. This frame has only one set of needles and if the cloth is knit tight will curl up on the

cut edges. I have had some experience with this kind of cloth, made from a 2/30s worsted and have also made another style, plating a 22 carded peeler yarn with a 60s worsted, which gave less trouble. The worsted cloth was made in small rolls or rather run into a box under the frame until there were about 18 garments in the box. This was cut off and run through a hot mangle coming out in folds about a yard long. They were then laid over slats in a steam box and the steam turned on, as shown in Fig. 4. When

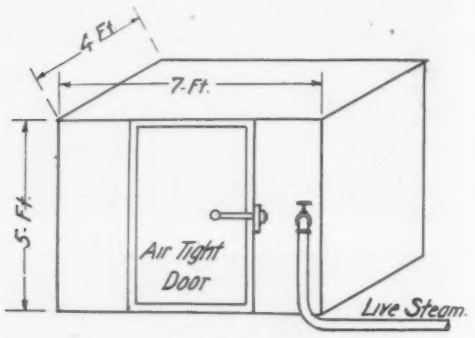

FIG. 4. A STEAM BOX

the goods were thoroughly steamed, the cutter laid them out on a table and cut one garment at a time. Even then the edges curled somewhat, but not enough to be troublesome. These goods were left in the steam box until ready to cut, as the moisture soon evaporates when the steam is shut off. Do not leave the fabric in rolls for any length of time.

The steam box, Fig. 4, was made from old yarn cases, and lined with old knit goods. The bottom was covered with tin and fitted with drip pipes. The door was made to fit tight and the inside edges made steam tight with a sort of weather strip. The live steam pipe was run in near the door, the goods were laid on the inside shelf in layers as they came from the mangle, and the steam turned on. This generally gave satisfaction as compared with cutting direct from the knitting frames. The seamers had trouble at first, but as they became more familiar with the process, they did better work. This class of goods, having no buttons, were put through the mangle after folding and put in boxes nicely pressed. Cymbal.

HAWSER AND CABLE TWIST

Editor Textile World Record:

I would appreciate your help in solving a little problem that I have been trying to settle as to the technical difference in "hawser" and "cable" as applied to the twisting and plying of cotton yarn. I have always thought that "hawser" meant yarn and first plying of the same hand twist and the last plying of the opposite twist, and for "cable" yarn one hand twist, first plying reverse twist and next plying same twist as the yarn. In other words the cable is alternating twist and the hawser two twists in the same direction, then reverse. Sumner (2139).

"Cable" twist applied to cotton yarn means that the first twist is opposite to the twist with which the yarn is spun. The next twist is opposite to the first and so on.

"Hawser" twist means that the first twisting is in the same direction as the twist with which the yarn is spun. The next twist is in the opposite direction. The yarn for "Hawser" twist is spun softer and with less twist so that it permits of twisting again in the same direction, otherwise it would kink up.

BLEACHING COTTON GOODS

Editor Textile World Record:

When bleaching heavy sheeting should there be any dressing or starch left in the goods after they have been put through two boils, two sours and a chemic? I find that when the goods are ready to go to the starch mangle after having been put through this process that they readily give a blue coloration to an iodine solution. Would you consider that we are getting to the bottom of goods? If we are not bottoming the goods, please make some suggestions as to the best process to use. Clayton (2203).

If cotton goods are thoroughly bottomed in the bleaching process, they should not show any trace of dressing or size. "Clayton" does not say how long he has boiled the goods or what process he is using. I presume, however, that he is using the caustic bleach. One sour indicates the souring of the goods before boiling and the second souring after the chemic bath. If this is the process that is used, with two good boils there should not be any size or dressing left in the goods. The iodine test is not a very good one at this stage of the process as there might be traces of acid left in the cloth, which is heavy material. In nearly all sheetings or bedspreads, unless given a double wash, are liable to carry traces of acid that

would become visible only by an iodine or a litmus test. The iodine test is used mostly on dry samples to find out what kind of sizing is used to procure certain finishes. It gives a distinct pink appearance with a blue ring around the spot if dextrine is used in finishing of the goods. If only starch is used a direct dark blue discoloration is obtained. The best test to determine whether the goods are thoroughly bottomed is the ink test. When the goods are ready for the mangle, find a seam in the pit or bin and cut out a piece about a foot square, mangle it and dry thoroughly. Let it get cold after drying, and then throw a good sized drop of ink from a pen on the cloth. If the cloth is thoroughly bottomed, the ink stays where it is thrown and spreads as it does on a piece of blotting paper and the cotton absorbs it. If the ink stays on the cotton in a ball or rolls along the face of the cloth, it is an indication that the cloth has still impurities in it and is not thoroughly bleached.

The question of getting to the bottom of the goods will be decided with this test. If the goods are not thoroughly bleached, as "Clayton" seems to think, and the process is the same as I have assumed, he must leave the goods in the first acid bath for a longer period, and the sour bath must be a little stronger. Boil the goods longer in each process. If I knew what the process was, the amount of drugs used, also the length of time the goods were left in the boil I could answer "Clayton's" question more intelligently. Delco.

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DETERMINING COTTON IN ASBESTOS

Editor Textile World Record:

Asbestos yarns are usually spun with about 10 per cent. cotton and we are anxious to know a simple and accurate method for testing the percentage of cotton in asbestos yarns. Can you give us this information? Lester (2219).

The presence of cotton or other combustible material mixed with asbestos can easily be determined by burning. The difference between the weight of the material before burning and the weight after, indicates the amount of combustible material in the mixture.

DAMAGE TO COTTON FROM CRAWFISH

Editor Textile World Record:

I have seen brief references in the press to the damage done the cotton crop in Mississippi by crawfish and would like to have you give further information regarding this matter.

Cotton Planter (2147).

We referred this inquiry to the U. S. Department of Agriculture and received the following reply:

The crawfish is very destructive to cotton over the Houston clay regions of Mississippi and Alabama. This area, known as the Upper Black Prairie Belt, includes about 1,000 square miles.

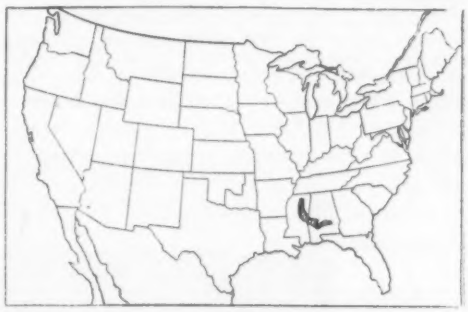

FIG. 1. MAP SHOWING LOCATION OF INFESTED AREA

The soil, which is very rich, overlies a sandstone formation to a depth of from four to fifteen feet. Except in times of drouth the water level is from two to three feet below the surface, which makes an ideal home for the crawfish. The number of crawfish tunnels to the acre varies from 1,000 to 15,000. I am enclosing a short paper on the subject and also a map, Fig. 1, giving the location of the infested area.

This Bureau, during the coming spring, expects to make a demonstration with bisulphide of carbon on 150 acres at Muldon, Miss., to point out the practicability of ridding the land of this pest. A good many planters in the Black Prairie Belt have given up raising cotton and corn on account of the depredations of crawfish.

The report enclosed in the above letter was by A. K. Fisher, the following being an extract:

While birds and mammals often play the role of pests, it will surprise some people to learn that a species of crawfish, or crayfish, as it is sometimes called, does extensive damage to crops in certain restricted localities in the South. Heretofore, except for occasional injury, as the result of burrowing into earthen dams, dikes, or fills, crawfish were generally supposed to be of little economic importance. Moreover, in certain localities the larger kinds, especially those inhabiting streams, are somewhat extensively used as an article of food.

Very different it is in the Houston clay lands of Mississippi and Alabama, where in certain areas infested by crawfish it is almost impossible to raise any crops with profit. The formation they inhabit is a heavy gumbo soil from 4 to 15 feet in depth, well saturated with water, and overlying a sandstone formation. This is an ideal home for a species of aquatic tendencies, since the driest seasons several feet of water remain in the tunnels, and during average seasons the water level is not over 3 or 4 feet below the surface.

The planters within the region of infestation have suffered heavily for years, but it is only recently that the outside world has learned of the extensive depredations caused by this crustacean. Over a wide stretch of country, estimated at not less than 1,000 square miles, crawfish prevent to a very considerable extent the successful production of cotton and corn. They do the greatest amount of damage just after the plant appears and before secondary leaves are developed. Large fields of young cotton have been destroyed in a single night. Corn also is extensively eaten, but is not so badly damaged as cotton.

COTTON FIELD DAMAGED BY CRAWFISH AFTER THREE PLANTINGS

An examination of the cotton field, following a raid by crawfish, shows that they tear away the tender cotyledons and carry them to their burrows. It is not known how many plants one crawfish will destroy in a night, but at least a dozen entire leaves have been found at the entrance of a burrow, while probably an even greater number had been carried below. It would seem that the principal feeding is done underground and not during the time of gathering.

Some idea of the number of crawfish in the district may be gained from the statement that in badly infested areas there are from 8,000 to 12,000 holes to the acre. On one plantation near Muldon, Miss., 27 barrels of crawfish were picked up in a season, and the following year 13 barrels more were secured. Another planter in the neighborhood estimates that 200 barrelfuls have been picked up on his plantation in 10 or 12 years. For this enormous quantity he paid a barrel of floor or cornmeal for each barrel of crawfish.

Some cotton planters replant after the first crop is destroyed, and occasionally they thus succeed in securing a fair stand, especially in dry weather, Fig. 2. The crawfish are much more active during showery weather than at other times. If, therefore, frequent rains occur soon after replanting, the chances for a crop are very poor, but in dry weather the plants may develop rapidly enough to be out of danger when wet weather finally appears.

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BREAKAGE OF ARTIFICIAL SILK IN DAMP WEATHER

Editor Textile World Record:

In the manufacture of artificial silk goods a great deal of time is lost by the stopping of machines during damp and rainy weather, owing to the bad running of the silk, the moisture having a tendency to weaken the filament. Will you inform me what methods are used in this country and abroad for overcoming this difficulty?

Morton (2232).

Our French correspondent replies to this question as follows:

The Chardonnet, Glanzhoff and viscose processes of manufacturing artificial silk produce the cellulose in the form of a hydrate. This is what causes a decrease in the strength of the material when moistened. Eschalier has found that a process of treating viscose by formaldehyde in the presence of acid remedies this difficulty by changing the structure of the material. It remains to be seen whether the elasticity of the filament is affected as the strength increases.

Gaul.

[The above reply indicates that the mill remedy for the difficulty which "Morton" inquires about consists in regulating the humidity of the work rooms. Ed.]

REMOVING STAINS FROM LACE

Editor Textile World Record:

I have read the replies to the question regarding spots on lace goods in the September issue, and believe I can add further information that will be of value. It is very hard to prevent oil or black lead from getting on the goods in the machine because the lace machine is so complicated. The twist hand and lace weaver must use oil on the bearings and black lead on the carriages and let them be ever so careful they cannot help some of it getting on the goods. So it is up to the bleacher to remove these stains. The first thing a bleacher should do is to get the lace to the bleach house as soon after the mending as possible. If goods are kept in stock for any length of time before bleaching it will make it more difficult to get the stains out. I have worked in a mill where the lace would come out covered with stains and I have always managed to get the stains out before going to the dressing or starch room.

After leaving the mending room the goods should be put in a kier at once. I have found the best material to use for the boil was caustic soda and soap. After boiling about 6 hours run off the liquor and fill up with hot water, if possible. Then add soap and boil 2 to 4 hours. After boiling run off and fill the kier up with warm water, making it just cool enough to handle. If the goods are made with Egyptian cotton a longer boil is necessary. After boiling put the lace in a washing machine, giving a good run in soap and soda. Then look the goods over and if the stains have not all disappeared give them another run in soap. The stains should be removed before the goods enter the chloride of lime bath. After bleaching and washing off use muriatic acid for souring. I have found that if any stains remained the muriatic acid would remove them. After washing off the acid I squeezed the goods to get the water out and then opened them out over a reel and had a boy look them over carefully for stains. If there were any I had them washed out with good soap and warm water, but if the stains were caused by iron I used muriatic acid, washing the goods out well. I then sent them to the dressing room and instructed the help there that if any spots were found that they were to be washed out before the goods were put through the starching mixture. If the goods are allowed to go through the different processes without trying to remove the spots until the end, it will always cost more and there is the risk of getting holes in the goods. The formula given by "Delco" is a good one, but try and not have to use it by getting the stains out while the goods are still in the bleach house.

Hector.

A NEW ROLLER CLEANING TUBE

Editor Textile World Record:

The new roller cleaning tube similar to an ordinary hand breast drill mentioned by "Calais" (2169) in the September issue is manufactured by the Woonsocket Machine & Press Co., Woonsocket, R. I., who are prepared to supply them at any time.

Blackstone.

EXPERIMENTAL COTTON FINISHING

Editor Textile World Record:

Do you know whether cotton goods finishers and bleachers have any method by which they can finish short lengths of cloth in order to test the possibilities of different finishes upon various fabrics before putting the goods through the works?

Bixton (2208).

The regular way of testing the effect of different finishes upon different fabrics is to sew the lengths together and put them through the large machine; or to sew them to the end of pieces passing through the process. Enquiry made of the chief Lancashire machine makers fails to disclose any regular manufacture of special plant, although doubtless small-scale apparatus could be made for some particular purposes. Much depends on the style of finish, that is, whether produced by starching and mangling, steaming and pressing or other means. Progress is made by error and correction and in the production of new finishes by means of steam and pressing there is a large and apparently unavoidable damage to goods. The losses make success more valuable and there is really little prospect of obtaining the most difficult results except by the sacrifice of bulks of goods.

Regent.

Knitting Department

THE KNIT GOODS SITUATION

An advance in the price of many lines of cotton underwear has taken place during the past month. Both light and heavy weights have felt the increase and one well-known line of men's fleeced shirts and drawers has been advanced from $3.75 to $3.87 1/2.

The increased cost of raw cotton combined with the well sold-up condition of many mills, is given as the reason for these advances.

Men's eleven-pound ribbed goods that were sold early at $3.60, are now priced at $3.75, and one of the low priced waste yarn lines that was sold at $3.37 1/2 has been advanced to $3.50.

Valid as are the reasons for the higher prices on men's goods, there does not seem to be the inclination to raise the price of ladies' lines in proportion. Possibly the reason for this is, that manufacturers of ladies' goods have not the number of orders on their books, or are better supplied with raw materials. At any rate the July opening prices are being fairly well maintained as yet.

Men's spring weight combination suits to retail at 50 cents have been advanced from 10 cents to 12 1/2 cents a dozen, and it is said that manufacturers of this class of goods have a very heavy business now on their books, and although this garment is supposed to be taking the place of the 25 cent grade Balbriggan shirts and drawers, yet the two-piece lines are well sold up and advanced prices are being obtained. Those that sold early at $1.65 are now quite generally priced at $1.75.

The Oneita Knitting Co., of Utica, are showing a men's white flat suit made knee length and either sleeveless or with short sleeves at $3.75 on which a large business has been taken.

In addition to these lines of 50 cent suits for men, are the various mesh lines sold at from $3.25 to $3.50, which get to the consumer for 50 cent garments, and which are now selling well according to the reports of the jobbers' salesmen, who are out soliciting spring business.

Men's suits to retail at a dollar is the next price at which any large volume is sold. Nevertheless there are a few lines being shown at from $5.00 to $5.50, made of carded yarn and trimmed like the combed yarn lines that retail at a dollar.

The Avalon Knit Wear Co. have withdrawn from sale their lisle thread lines of men's suits that were offered in July at $7.00, having all the orders they can take care of for the balance of the season.

Some new lines of boys' suits are in the market, among which may be noted the one made by the Royal Gem Mills, at $1.90 in short sleeve and knee length with a fine cloth collarette and closed crotch. Also new line by the Utica Knitting Co. at $3.12 1/2, and at from $3.50 to $3.75 a number of makers are showing boys' ribbed suits in white and ecru and some buyers have told us that these have cut into the demand for 25 cent balbriggan shirts and drawers to quite some extent.

Some few lines of flat balbriggan suits for both men and boys are being shown, but so far as we can learn, there is no comparison between the size of the business being placed on the flat suits as compared with the ribbed.

There has been considerable discussion as to the merits of the various makes of closed crotch suits. Many circular letters have been sent out by individual manufacturers, and also by groups of manufacturers, boosting one make, condemning another, and practically threatening buyers who dared to place orders on some of their competitors' lines. As a result of some of this publicity, the Atlas Co. of Piqua, O., has brought action to recover from the Cooper Co. of Kenosha, Wis., $25,000 damages, and has asked for an injunction alleging misrepresented advertising. It is hoped that this

matter may be soon settled by the courts, so that the business may be cleared of the cloud of uncertainty.

Jobbers' salesmen have now been out about a month and from all the reports that we can obtain, a very satisfactory business has thus far been booked. From the orders taken, it is plainly evident that combination suits for men, women and children are selling very freely, and are rapidly replacing many lines of two-pieced underwear.

Duplicate orders on heavy goods have come to manufacturers' hands in fairly good volume during the past month, and some of the combination suit manufacturers have been obliged to decline orders, except for delivery during the months of November and December.

The few manufacturers who now make flat wool goods, have plenty of business on their books to keep them engaged until the end of the season. This is an end of the business which does not assume any very great activity during the early selling season, but when the cold weather comes on, there seems to be a shortage of the desirable lines and manufacturers are being urged today to anticipate delivery dates that were given early in the season.

HOSIERY

The hosiery end is rapidly approaching a sold-up condition, especially in the majority of the lower priced lines. Buyers operated quite freely during the opening months on goods to retail at 10 and 12 1/2 cents, and recently have been sending in additional orders. Notwithstanding advanced prices have been asked, the orders were placed generally, and now most makers are only in a position to accept further business for deliveries late in May and June.

An exceptionally large business has been booked on fiber silk hosiery to retail at 25 cents, and the only complaint we have heard on this matter is that the retailers are placing their orders on it to the exclusion of nearly all other lines. As a result of this, some lines of mercerized goods are being offered freely at the same prices as were named last June. Silk goods in the better grades have also sold well, and advances of from 12 1/2 to 25 cents a dozen have been obtained lately.

Shoe manufacturers advise us that the indications point to another season of white footwear. Thus far the orders placed on white hosiery have been heavy and there is no doubt of the popularity of white hose for another summer. Few orders are being placed on tans, but it is quite evident that this color is not as good as it has been. In place of the tan business, there is developing quite a call for colors of high degree, such as Kelly green, Emerald, Copenhagen, Cardinal and Taupe.

Many orders for white half-hose have been placed for spring and just recently quite a demand for champagne colored half-hose has developed.

CHEMNITZ REPORT

Trade is very satisfactory to manufacturers at the present time. Many resident buyers have received large orders from their houses which they are unable to place, as makers are asking high prices and are not promising any early deliveries.

Nearly all the foreign markets, as well as the home trade, have placed large orders. The extra quantities wanted by the American importers, bring the demand much in excess of what the machines can turn out. One order from an English house placed recently, called for 20,000 dozen of one number.

The 33-gauge machinery which had been idle for a time, is now busy on orders for the South American markets, and the 36 and 39-gauge goods are being taken the world over. Split-sole hosiery is scarcer than any other kind, as the extra labor of making has caused many makers to give them up, and those who still have them in their lines, have orders to keep them going 'way into next summer, and naturally the price is very high in consequence.

The steady advance in yarn does its share to bring up price of hosiery, and the heavy demand does the rest. Goods that sold a year ago at M 6.60 are now held at M 7.50 to M 8.80, and while some lines are still

priced at M 7 to M 7.25, qualities are not as good as those that were sold at M 6.60. For M 8.80 to M 9.20 there are still some lines of mercerized goods to be had, but the qualities are not what we have been used to. The weights are the same, but are made of inferior yarns. Black is still leading by far, while tan is not bought as much as last season. White, however, is being ordered a great deal more than ever before. Other colors are so little asked for as not to count.

SWEATERS

Early in June it was predicted that sweater coats would be scarce during the months of September and October on account of the great demand that was then evident for these popular garments, and at that time, duplicate business was coming to manufacturers' hands in large volumes. Since then a strike has taken place in the industry, tying up for several weeks the output of factories, with a number of employes variously estimated at from 8,000 to 16,000; and this has had the effect of making a virtual famine in many grades.

The strike was settled by a compromise, but it has shortened the output in the two large centers of production, and although the strikers are returning to work, it will be some time before a normal output will be reached again, and then only at higher costs to manufacturers, as they have been obliged to advance wages and shorten the hours of the operators.

The principal lines affected are low and medium priced goods, running from $6.50 to $18.00 a dozen, and manufacturers who are in position to take any orders on these grades are asking advances of from $1.00 to $3.00 a dozen, which buyers are apparently willing to pay in order to get deliveries.

A heavy demand has been noted all season for Shaker knit coats and more recently there has been a tendency toward the Jumbo or rope stitch garments, a number of lines of which are being shown at from $33.00 to $42.00 a dozen. These are all being taken with the shawl collars in maroon, oxford, navy and tan, and are being worn by both men and women.

Two-toned brushed coats made of high grade long-stapled wool to imitate the genuine Angora, have been brought out recently. These are being sold at from $6.00 to $8.00 apiece, and they are selling well with scarves and caps or hoods to match.

Belted coats are also being asked for to quite some extent. These are being taken in brushed fabrics in high colors, in imitation of the cloth sport coats so much in vogue.

SECONDS IN RIBBED UNDERWEAR

BY TRENTON

Seconds or imperfectly finished goods are the cause of heavy losses to underwear manufacturers. It is more noticeable on the higher grades of silk and worsted, for the buyers in large concerns will sometimes throw out or ship back a case of goods if there happens to be a spot of dirt or oil on one garment, a flaw in the yarn when knitting, or a mistake in finishing. Seconds are generally sold at a loss. A mill in the South was making a light weight bleached garment from a cheap carded yarn. The first year 43 per cent. of seconds were made, and during the last six months of the year there were double the number that had been made during the first six months. This was due to inexperienced help and to the run down condition of the machines. The seconds were due to various causes such as poor bleaching and later poor knitting.

The firm decided to try new management. A superintendent and bleacher were secured along with a knitter and a forelady for the finishing department. The superintendent, bleacher and I as knitter arrived in the town a few days apart. We went through the mill examining everything and took along with us to the superintendent's office samples of cloth in rolls and short pieces, and some finished goods. The goods certainly were in very poor condition and contained everything from kier stains to knitting holes, burnt cloth and poor finishing. There was roll after roll burnt in the bleach. These rolls would cut up all right, but going through the mill would almost fall apart during the process. There were finished

goods in boxes that had turned yellow in a month or so. It was a wonder that a perfect dozen was ever shipped.

We laid our plans that day in the office. The bleacher was to finish what stock he had on hand and fix up the bleach house to suit himself. The superintendent and I were to get the knitting room in shape. The superintendent, an old boss knitter himself, with a helper was with me. We first took down and cleaned a frame, looking it over carefully, the helper doing the cleaning. We sorted out the needles, throwing those away that had loose rivets, bad hooks or latches; even bent needles went into the knitter of many years' experience to take down and set up a frame and get it ready to run will give a good idea of the condition of the machines. They all seemed to be alike. There were worn out yarn guides to be ground, cams to be smoothed, crooked dials to be trued and new needles to be worked down on fine yarn.

The next morning we started on another frame and at the end of the day had that ready to run. We kept this up until half the frames were in good condition and then started to make the goods. I was to finish the work alone as we knew the cloth was right and there was no particular rush for

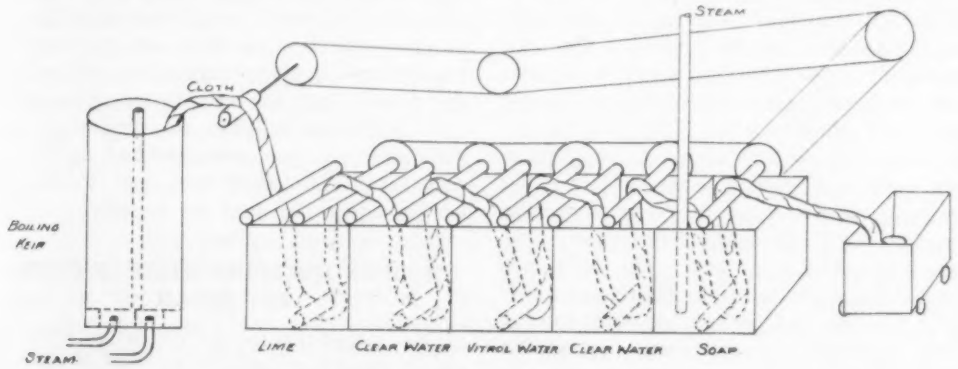

FIG. I. ARRANGEMENT FOR BLEACHING KNIT GOODS

scrap heap. The cams were in bad shape and we ground out the low spots and nicks, polished and replaced them. When set up we trued the dial and put in the needles that we found to be all right. We soon found it was easier to put in new needles, as long as they lasted, and sort over the old ones later.

When ready to run the stitches were regulated to see that one thread did not draw more than another. We did this by marking the yarn close to the cones and turning the frame until the marked spots were at the tension disc near the bottom of the yarn rack. This gave an even length to all feeds, and an even flat look to the fabric. I found this a better way to even stitches than the old way with a foot rule or stick.

We worked hard all that day and before we left each had a frame ready to start next morning. The length of time it took an old the bleach house could not handle much just at that time. The frames were a little over a year old, but never having had any care had gradually run down until they were not of much use even on the cheap class of goods we were making. In addition to the knitting machines I was to fix the sewing machines, so after the knitting room was in good shape I started on the finishing machines where the superintendent had left off. I have seen many sewing machines, but none to compare with this lot. There was a Union Special twin needle lace machine that made more noise than than all the other machines put together. It shook the whole table and I soon discovered that the needle bars, the eccentric connections and about everything that could make a racket were loose. A Standard button sewing machine was little more than a scrap heap. This had a style of shuttle that was not used on that

kind of machine; about every spring was useless and the rebound lever laid on the table near the machine. It was some job, I soon found, to start up these finishing machines. A Merrow shell stitch machine had the frame cap off, and the cam rolls were missing. It took some time to find the missing parts of the different machines. I found on the end of a bench a bread pan full of old screws and parts of machines, but water had dripped into it and everything was either sweated or rusty. I gave up the job in disgust until the parts I had ordered arrived. This took about a week or ten days and at the end of another ten days we had the finishing room ready.

This left the bleach room as the weak spot. The bleacher had made a new arrangement of the tubs for a continual bleach. I did not know much about bleaching at the time, but I could help out. The boiling kier was 16 feet high and about 6 feet across, fitted with steam and water pipes. The bleaching tubs were all in a row, five tubs, bleach or lime tub first, clean water, acid, clean water and soap last. The soap was kept boiling when in use. There were rollers at the top and bottom of each tub, all belted together and run from one pulley. We could bleach anywhere from 40 to 60 rolls at one time. First we would lay the cloth in the kier, putting a roller in it and unwind to the end. Then we would tie both ends together and start on another roll until there was one string of goods on all the rolls. This arrangement is shown at Fig. 1. Another man would lay the cloth around the bottom of the kier, keeping the goods even on the platform and away from the center pipe. This gave plenty of boiling space and the water would be thrown over the top of the cloth from the center pipe. We filled the kier in the afternoon, boiled all night in caustic soda, ran off the liquor in the morning, put the end of the top roll over a roller near the kier, ran it through the bleach tubs and started the bleaching. Sixty-five rolls were generally bleached in about five hours. The goods were a cheap, light, two-pound garment, boiled and softened, and took the bleach well. The rolls, or skeins as they were called, were hung up in a heated room to dry and later were pulled down in boxes, rolled up, when they were ready to cut. We bleached every other day.

When the bleach house was in order we started work in earnest. There were about 400 rolls ahead of the bleach. This gave us a good start. The first batch that went through was perfect except the end rolls. They were burnt some as it took too long to get them through the tubs. We soon overcame this and could handle the ends more quickly. When the first batch was dry the cutters got busy and, as they did not have to turn the cloth to cut out the holes, they cut many more than usual in a day. The finishers after their two weeks' vacation started in to make up for lost time and the goods fairly flew around, for the superintendent and forelady were there with a smile and I was ready for any machine that would not do the work. The production jumped daily until the 300 dozen we had figured on was an accomplished fact, and it did not vary much in the next six months.

MODERN KNITTING MILLS IN CHINA AND JAPAN

The competition of the Orient with its low priced labor may have to be considered seriously in the not far distant future. We have been accustomed to think of cottons and silks as the textile products of China and Japan, but the development of the knitting industry in the past few years while not yet attaining large proportions has been worthy of notice and the recent reports of our consuls on this subject are of particular interest. Consul General Anderson at Hongkong writes:

The export of Chinese-made knit garments (made in Hongkong of American cotton yarn) to the United States is the latest development of Hongkong-American trade. The export of such garments is made almost entirely for the use of Chinese in the United States, but it has grown into considerable volume and Hongkong factories are paying considerable attention to the trade. One factory reports that almost half of its entire output is now being exported to the United States.

The growth of the knitting-factory industry in Hongkong is of decided significance in the clothing and cotton trade of this part of the world. The factories have been developed almost entirely within the past three years. The chief factory in some respects is a foreign concern known as the Wei San Knitting & Spinning Co., which has been in existence some 7 years and has a daily capacity of 100 to 120 dozen sweaters or pieces of underwear and similar garments. This factory employs about 125 people, mostly girls and young men, whose wages run from 48 cents to $4.40 gold per week, the greater number earning about $1 gold per week. Similar wages are paid in all such establishments. There are seven other concerns of more or less importance owned and operated by Chinese companies and under Chinese supervision, five of which are equipped with considerable machinery. One of these is at Causeway Bay, Hongkong, and is the property of the Wah Mee (Chinese American) Co. There is a small factory at Tsim Sha Tsui and another at Sham Shui Po, all on Hongkong Island. Four others are located in Kowloon. They are the factories of the China Foreign Knitting Co.; the Man Sung; Li Man Hing Kwok; and Quong Sun, and all are more or less thoroughly equipped in a modern way.

The largest and first established of the Chinese enterprises is the China Foreign Knitting Co. in Kowloon. This concern is typical of the rest of the establishments. It employs about 200 people and devotes its plant to making foreign-style knit underwear and hosiery. Its present capacity is 60 dozen pieces of underwear and 100 dozen pieces of hosiery per day. Its plant includes 40 machines for knitting underwear, most of them manufactured at Troy, N. Y.; 80 machines for knitting hosiery, most of them from Pawtucket, R. I.; and one other machine of American make for making lining for underwear. Other native factories are similarly equipped, though without quite the capacity of the factory described. There are a large number of stocking-knitting machines in use in homes all over Hongkong and in Canton and many country villages.

The knitting establishments are quite modern for Chinese concerns in their buildings and other arrangements, and show constant improvement in plant and in the quality of output. All of them use American knitting cottons almost exclusively, claiming that the American yarn runs better in the machines and otherwise suits their needs. The factory described makes stockings in four standard colors besides white, and underwear in three standard colors besides white. The product of the factory described sells at $11 to $13 local currency per dozen pairs of underwear and at $1.60 to $2.20 local currency per dozen pairs of hosiery, the Hongkong dollar at present (May, 1913) being worth about 48.5 cents gold. The goods for local use are distributed largely through the Chinese department stores in Hongkong and through local brokers to small Chinese shops and peddlers. Those exported are sold direct to the Chinese exporting firms and are often sold at substantially the cost of manufacture to prevent the accumulation of stocks. The amount of such goods sold in the interior districts beyond the ordinary scope of foreign trade is constantly increasing at a very satisfactory rate and in line with the growing use of such goods by the Chinese all over China. The competition met by the goods is almost exclusively Japanese, the Japanese factories usually having traveling representatives in this field selling direct to retailers.

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Consul General F. D. Cheshire, Canton, reports: There are at present in Canton nearly 3,000 small hand knitting machines which turn out numerous cheap socks, cotton singlets, and sweaters in competition with imported goods of British, German, and Japanese manufacture. The one small knit-goods mill (Wing Hing & Co.) in Canton produces socks and underwear. Native-made socks from hand machines sell at $1 Canton notes or $0.38 gold per dozen, while the sweaters sell for $16 to $17 Canton notes, or $6.68 gold per dozen.

* * *

Consul C. L. L. Williams, Swatow, reports: There is in Swatow a promising

market for knitting machines. Up to the present hand and semiautomatic machines have been principally in demand, but there are indications that there may be a market shortly for full automatic power-driven machines.

At present there are about 230 hand machines for knitting stockings (socks) in use, capable of producing 450 dozen pairs of socks per day, and about 35 semiautomatic machines, also operated by hand power, capable of producing 175 dozen pairs of socks per day. With the exception of about 20 machines in a factory in Chaoyang, all of the above are in home use. In the factory to which reference is made hand power is used. Rates of wages per month paid in this factory are $6 to $8 Mexican ($3 to $4 U. S. currency) with food to machine operators. Boys spooling cotton yarn are paid by amount of work done and earn from 6 to 10 cents Mexican (3 to 5 cents U. S. currency) per day; they receive in addition two meals a day.

The machines at present in use run from 72 to 190 needles in a 3 3/4-inch cylinder, both coarse and fine goods being knitted. Bombay cotton yarn is used exclusively. The majority of the hand machines in use and all of the semiautomatic machines are of American manufacture. For knitting the ribbed tops of socks English and Canadian machines are used. About 40 German hand machines are also in use.

The factory mentioned markets its output in Shanghai and the north of China. A combination of a number of home workers has been formed which markets the bulk of its output in Siam, Singapore, and other southern ports. The majority of the home workers, however, sell the article knitted to local shops and peddle a portion of them on the streets. The average price of socks knitted locally is about $1.50 Mexican ($0.75 U. S.) per dozen.

To give some idea of the market for socks it may be mentioned that in addition to the local output over 14,500 dozen pairs of first quality and over 27,500 dozen pairs of second quality cotton socks were imported during 1912.

There is at present under construction a steam factory, financed by Chinese, which will have for its initial installation 20 full automatic knitting machines of American manufacture.

No underwear is knitted locally, but some 25 machines of the "Lamb" type are in use in knitting coarse cotton sweaters. The daily capacity of each machine is 8 sweaters.

I am informed that to sell knitting machines locally it is necessary to have a machine for demonstration purposes. Unfortunately the majority of American manufacturers, even when anxious to enter the market, are not willing to ship any machine except against cash. In refreshing contrast is the action of one American firm which built a special machine of the semiautomatic type to certain specifications, shipped it free to a local agent, and in return for its trouble has already sold some 30 odd machines of the same type. The knitting industry appears to be making rapid advances all over China, and if American manufacturers desire to secure their share of orders for machines it will be necessary for them to do more than send out catalogues.

* * *

Consul George N. West, Kobe, Japan: The Osaka Knitted Goods Guild, which city is the headquarters of this industry, state that it is developing very rapidly. At the end of 1913 the number of members of the guild was 1,451, an increase of 71 over the preceding year, and the number of operatives employed by them was 9,860. The value of the goods for the home and foreign market produced in Osaka in 1912, as compared with 1911, is as follows:

Home Market.	1911	1912
Underwear	$927,297	$1,016,785
Socks	116,300	133,030
Gloves	58,155	73,750
Others	61,358	79,677
Towels	184,077	193,281
Total	$1,347,187	$1,496,523

Foreign Market.	1911	1912
Underwear	$2,778,241	$3,655,367
Socks	483,624	523,642
Gloves	70,628	102,390
Others	.....	61,200
Towels	739,907	3,902,992
Total	$4,072,400	$8,245,600

As may be seen from the statistics, the value of goods produced last year for the home market shows an increase of only $149,336 over 1911. All classes of goods, except towels, showed some decrease in quantity, the increase shown in the value being due to an improvement in quality. On the other hand, a good increase was shown in both the value and quantity of goods for export. The total export of knitted goods from Osaka in 1912 amounted to about $4,347,600 in value, an increase of over $1,000,000 on the figures for the preceding year. The increase is attributed to the continued demand in India and other parts of Asia, and specially to a marked increase in the demand in China.

Almost all the knitted goods and towels exported from Japan come from Osaka. The average price of knitted undershirts exported to India is 83 cents a dozen, while the average price of those exported to China is $2.21 1/2, a far better quality even than the goods sold in Japan. Shipments of knitted goods are distributed about as follows: Forty per cent. to British India, 30 per cent. to French India, 20 per cent. to Hongkong, and 10 per cent. to China. Osaka manufacturers hold large orders from China this year, and it is expected that the present positions held by India and China as customers for Japanese knitted goods will be reversed before long.

The wholesale prices of knitted goods per dozen are as follows: Cotton undershirts for winter in China, $3.50 to $5.50; for summer in Philippines, $1 to $1.50; for summer in India, $0.65 to $1.25. Cotton undertrousers, $3 to $5. Cotton stockings for winter in China, $0.40 to $0.75; for summer in India, $0.25 to $0.275. Wool stockings for China, $1.25 to $2. Silk socks, $4 to $6.50. Silk undershirts, $15 to $40.

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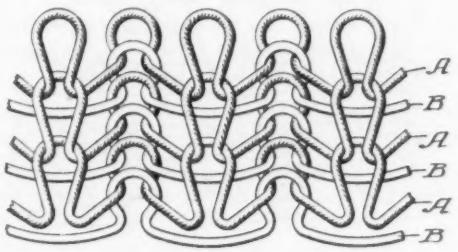
Of the 243,144 pieces of cotton sheetings imported into Chefoo, China, in 1912 more than 70 per cent. were American, there being 32,000 more pieces of American sheetings than in 1911. About 80 per cent. of the 5,000,000 pounds of foreign cotton yarns imported into Chefoo in 1912 were of Japanese manufacture.

A FLEECED KNIT FABRIC

The knit fabric shown at Figs. 1 to 4 has recently been patented, and is described by the inventor as follows:

The object of this construction is to produce a ribbed knit fabric which will present on the outer side the usual regular ribbed face, while presenting on the inner side a face specially adapted for the production of a thick, soft fleece when brushed. This object is attained by knitting the fabric ribbed on both faces and throwing into one face sup-

FIG. 1. THE FACE OF THE FABRIC



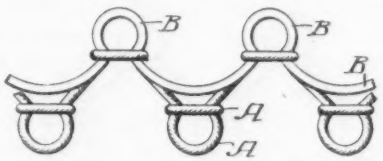


FIG. 3. THE BACK OF THE FABRIC

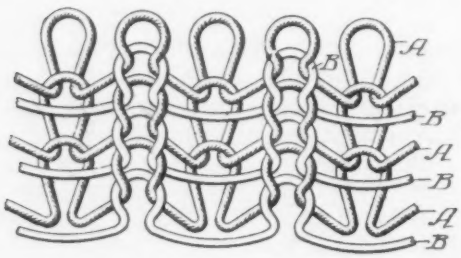
plemental loops, preferably at every other feed or course, so that there will be twice as many knitted loops on the inner face as there are on the outer face, thus presenting a closely-knit surface which is well adapted to produce, by brushing, a thick soft fleece without taking from the loops enough fibers to weaken the body of the fabric. At the same time, the regular ribbed face appearance on the other side is maintained.

Fig. 1 is a view looking at the fabric from the outer or front face of the fabric; Fig. 2 is a similar view looking at the inner side or back; Fig. 3 is a plan view of the fabric after a course B has been made; and Fig. 4 is a similar view after a course A has been made and showing a course B "cast off" the dial and cylinder needles but showing loops formed by the dial needles.

The outer face will show the usual ribbed face (of dark yarn, in the case illustrated), while on the inner side or back there will

appear a combination of dark and light loops, this side presenting accordingly twice as many loops as on the outer face. This construction may be produced by feeding two separate and independent yarns, A and B, alternately to the dial and cylinder needles of a ribbed knitting machine. The one feed of yarn, which is the dark feed, A, in the example illustrated, is fed and knitted by the cylinder and dial needles in the usual manner of ribbed knitting. The alternate

FIG. 2 AN INNER VIEW OF THE FABRIC



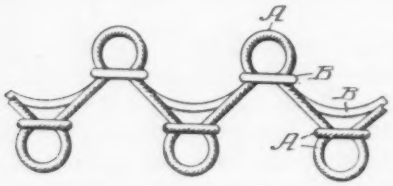


FIG. 4. THE BACK OF THE FABRIC

feed, B, indicated in white in the drawing, is also fed to both series of needles, but in such manner that there is no loop knit by the cylinder needles, the loop being cast off without being engaged by the hooks of the cylinder needles and before another feed of the dark yarn. In a two-feed machine, the cylinder and dial needles are so actuated by their cams at feed No. 1 as to trap the yarn, A, supplied in the hooks of both cylinder and dial needles and then draw loops of that yarn to the opposite faces of the fabric through the previously formed loops now cast off those needles, as in ordinary rib knitting. At feed No. 2, course B, the dial needles are so actuated by the cams as to trap the yarn supplied in the hooks of the dial needles, but the cylinder needles are there so actuated that the yarn, B, will not be caught in the hooks of the cylinder needles, but will be laid back of the latches of the cylinder needles and held there until at feed No. 1, these loops of yarn, B, will be cast off the cylinder needles with the loops of yarn A and so thrown into the space between the front and back wales, as shown in the drawing.

The result is a ribbed knit fabric having an equal number of wales on its two faces, but the fabric will have knitted courses which form parts of the wales on one face of the fabric but do not appear on the other face, floating behind the wales of said other face.

MILL EXPERIENCES

Under this head we will publish from time to time stories from practical mill men, telling of vexatious and unusual difficulties which have occurred in different branches of mill work, and how they have overcome them. We invite mill men to send us an account of such experiences. We pay, of course, for all that we use. Facts told just as you would tell the story to a friend are what we want, not fancy writing.

A MILL EXPERIENCE

BY RUTHVEN

A manufacturer making gold, silver and antique trimmings, sent for me and said he was having a great deal of trouble in running tinsel threads on his knitting machines, his principal difficulty being that the yarn used in making the stitches would break or crack continually. He told me of having tried various oils and emulsions on the threads, dampening them with cold, wet cloths laid against them while knitting, and also using steam to soften them, all of which methods, while they lessened the breakage to a slight extent, were not practical. The dampness from the cold cloths and the steam rusted the needles so that after two days they were unfit for further use, the moisture also having a tendency to tarnish the entire tinsel trimming. The oils and emulsions would clog up the latches with the lint from the filling of the tinsel threads. The manufacturer also told me he did not understand very much about the working parts of the knitting machines. He found that by using the finer grades of tinsel threads he got better results with a smaller percentage of waste, but the cost of the 12s tinsel was so much more than what he had figured on that he would be unable to compete if he were compelled to use it in place

of the 7s and 8s that he had based his prices on.

He showed me the machine that was giving the trouble. It was one of the flat knitting machines, thirty-six inches wide, used by the millinery and dress trimming manufacturers, and had a working space of about thirty inches. The needles were screwed to the needle bar, which was controlled by a set of cams at the back of the machine. The needles worked back and forth through a gauge bar, which in turn guided the needles and performed the same functions to the flat knitting machines that the cylinder does to the circular machines. On the flat knitting machines that he was using various designs of different tinsel guimps and cords were woven and were bound and held in place by the stitches of tinsel threads, the breaking of which was causing the trouble

On examining the machine I found that among the eight needles in use, there were four different gauge needles, and that three or four were about one-sixteenth of an inch shorter than the rest. The proper size should have been a 12 gauge needle. The overseer then informed me he did not think that made any difference as he had no difficulty with any of the other materials he had been using and could not see why that would effect the threads in this case. I found that the needle bar on the right end of the machine was being drawn back over an eighth of an inch deeper into the gauge bar than was the left end. This was caused by the crank connecting the needle bar to the cam being an eighth of an inch shorter than the other, which caused more breaks on the left hand side of the machine, because the take-up at times would not draw off the stitch and the second stitch forming on top of the first caused a break.

After explaining these two causes to the overseer and the manufacturer, I had a boy clean the work from the machine, and had the overseer remove the needles, and then had the frame thoroughly cleaned. I then adjusted the needle bar and filled the machine with all No. 12 gauge needles, eighty in all. I threaded up the machine with the next to the coarsest size of tinsel, two ends on a spool, running from a jack at the bottom of the machine over a stationary bar in front and also at the bottom on a line with the warp bar, which fed the tinsel threads to the needles. In order to show what I was going to do after I had everything in readiness to start, I asked the overseer to run the machine and in the first half hour of running only ten of the threads broke. On careful examination I found four of the breaks caused by bad, bulky knots and the remaining six by lumps in the filling. I then sent for a small cake of paraffin and started the machine again, asking the overseer to dab the tinsel threads occasionally with the bar of paraffin, touching them with a slight up and down motion. During another half hour's work only one warp broke and that, I believe, was due to the too strenuous dabbing by the overseer.

I then explained what I proposed doing and seeing the apparent success of the experiment, I was told to go ahead. The overseer got me a wooden pole, thirty-eight inches long and one inch in diameter. This I covered with felt cut one inch wide, from one end to the other, wound on spirally and fastened at each end with tacks. Then I gave the pole what is called a paraffin bath and made a galvanized box, 38 in. by 2 in. by 2 in. I melted two pounds of paraffin and dipped the felt covered bar in the bath, revolving it for a few minutes until the felt had a coating of paraffin absorbed and clinging to it. I let it dry for five minutes and repeated the operation until the pole had a coating about a quarter of an inch thick. I allowed one coat to dry before putting on another. Then I fastened this paraffin pole to the machine in such a manner that every one of the eight warps of tinsel passed over it on their way to the needles, For the next three hours not a thread broke. I then advised the overseer to shift the pole occasionally and turn it so as to give it different contact points. We increased the speed of the machine and also used the coarsest grade of tinsel without any difference. I then suggested to the overseer the advisability of having the pole revolve continually and shifted gradually by means of gears and cams attached to the pole, which he promised to do. I might add that through all my experience with tinsel threads in making stitches on all kinds of knitting machinery, this method of using paraffin has worked the best.

Dyeing, Bleaching, Finishing, Etc.

DYEING OF CARPET AND RUG YARNS

BY DR. LOUIS J. MATOS

The present trend of carpet coloring is constantly towards the production of shades that possess fastness to light when viewed from the standpoint of the purchaser. The general public has been educated to expect that colored textiles, for whatever purpose intended, shall be dyed with colors that will not fade as readily as those used formerly, although it is a matter of scientific record that very many fast colors have been known to carpet manufacturers for a long time, but that they were not used generally in the carpet mills until the demand for faster colors came from the outside. Competition has had its influence in causing carpet mills to seek for faster dyes. These mills would not otherwise have emerged from their usual routine of dyeing with the older dyes that have done good service for a couple of generations, but which must in the natural order of events give way to more modern products. Now that a number of progressive carpet manufacturers are realizing that the best policy is to make use of only the fastest dyes procurable, it becomes only a matter of time when the remaining manufacturers in like manner will adopt the same course.

At one time the carpet manufacturers were able to see satisfaction only in the purchase of dyes that were low in cost without any regard whatever being paid to the other properties that could only be obtained by using dyes costing more money. This policy has always been wrong, for the reason that the dyestuffs actually contained in one hundred pounds of carpet yarn ready for the loom will seldom, if ever exceed (allowing for various depths of shade from light to dark, in the usual makeup of flower or oriental pattern), three pounds, which at fifty cents per pound is only 1 1/2 cents per pound of dyed yarn. In a running yard of 27-inch carpet the actual cost of dye used can be practically neglected—being in reality the least costly item for supplies in a yard of finished carpet, with the possible exception of the glue for stiffening.

The most important operation in the treatment of carpet or rug wools is the preliminary scouring, which should be done carefully that the requisite elasticity and dyeing properties of the fiber be retained. No special rules can be given for scouring carpet wools except that the scour liquors be sufficiently soapy to keep a fair lather, and made alkaline with enough sal soda to start the dirt. The temperature may be allowed to go as high as 125° F. for ordinary wools, while for coarser varieties, such as are used for many kinds of rugs, the heat may be increased somewhat without injury. Always use a thermometer in ascertaining temperatures when working with wool. To depend upon the hand as a thermometer has been the cause of many batches of wool being spoiled.

After scouring, the rinsing should be thorough, and no excessive amount of alkaline soapy liquor should be allowed to adhere to the wool when it goes into the driers, as that is a serious cause of bad spinning. Wool oiling for carpet stock is not a matter requiring the same care as for clothing wools, but as wool oils containing varying amounts of mineral oils are usually used, excessive quantities of such oils should be avoided. Too much wool oil means harder working of the yarn in the scours before dyeing and this in no way helps the condition of the yarn. Ammonia in yarn scouring is to be strongly recommended, as by its use the yarn becomes much cleaner and in better condition to take the dyes, besides possessing a more springy nature, a most desirable quality in a carpet yarn. Wool oils that contain a great percentage of non-saponifiable or non-emulsifiable substances are always difficult to remove by ordinary scouring, and are likely to leave the skeins in an apparently soggy or sticky condition. Long ex-

perience has convinced the writer that lubricating oils of the olein-so-called red oil type are satisfactory to work with as they scour out easily with the aid of only a small quantity of ammonia sufficient to form a soap with the oil on the wool, and with a small amount of tallow soap in the liquors to give a body. Perfect dyeing, that is, for the production of level shades and corresponding penetration of the yarns, this latter being a most necessary condition in the manufacture of cut-pile carpets and rugs, requires that the yarns to be dyed shall be absolutely free from all traces of oils and grease. Imperfect scouring has often been the cause of otherwise good dyeings being rendered unsuitable for velvet carpets because the yarns had not been so well scoured as to remove the oils from the center of the threads and which formed a sort of a resist against the dyes. Carpet yarns are mostly dyed in open tubs, which though antiquated, are capable of turning out a rather large output. Rotary dyeing machines, and horizontal dyeing machines, giving to the yarn a slight up and down and to and fro motion are also used and it is a cheerful sign to note that machine dyeing is gradually displacing the hand kettles.

Carpet yarns to be dyed the average range of shades can usually be turned out in sheets of 100 pounds each per hour per kettle, when the dyer is on the job and with a good second hand to keep the men and machines moving. Efficiency of a carpet yarn dyehouse is to be gauged, not alone by the number of sheets of wool dyed per day, but rather by the rapidity with which they are handled by the whizzers and the dry rooms. There exist many dyehouses that have excellent appliances capable of working uniformly at full swing week in and week out, but are handicapped by the inability of the whizzers and driers to take care of the output, with the result that the dyed yarn backs up and chokes the drying end of the plant towards the end of the day. The great fault with most dry rooms is that they are not sufficiently large to dispose of the great amount of moisture taken into them.

The colors best adapted to the modern conditions of carpet yarn dyeing are selected according to their fastness to light, and slow dyeing properties, which insures penetration; the colors being taken up by the wool at the boil. It is a fact well established that carpet yarn dyers look with disfavor upon dyes that require for their application any process outside of the old and tried vitriol and Glauber's salt method, consequently the dyes used belong to the wide acid dyeing group.

As a very wide range of shades are continually in use in most carpet mills, it becomes a matter of some importance for the dyer to keep his line of dyes down to the smallest limit of numbers in order to avoid the possibility of confusion, and at the same time to have these dyes possess about the same general properties so that they can be mixed together for the production of compound shades without fear of consequences. The essential point in dyeing carpet colors is to have at hand a few shading colors, and the writer's experience in this line of work has taught him that a small group of type colors with a full knowledge of the strength and shade value of each, is far better and more satisfactory than to work with a long line of standards and with a short line of shading colors.

A CONTINUOUS BLEACHING PROCESS

BY HECTOR

The method of bleaching described in your August issue in the article entitled "A New Bleaching Process" is not, in my opinion, any better than a process I used in Scotland many years ago. At that time we were doing a big business in bleaching fine muslins and printing dress goods and handkerchiefs. We used a bleaching method that was in general use then and which consisted of boiling the goods in kiers, then running through washers, over the storage pit and down through the bleaching solution; then through a pair of squeezers and landing them in the storage pit to bleach. At one time it seemed impossible for us to get an even bleach. We put up a chain conveyor and ran the goods from the bleaching

tank into the farther end of the conveyor. When we had run from 30 to 60 minutes or until the first part of the goods was bleached, we took the first end that had been run through, entered it and started No. 2 washer. This took all the bleaching liquor out. We ran the goods through the acid tank and squeezers and then on conveyor No. 2. In about 30 minutes we put the goods through washer No. 3. This took out all the acid and from there the goods were put through a squeezer and then on trucks where the lots were separated. This method did away with the storage pits and we did not have to alter the speed on any of the machines. We had variable speed pulleys on our conveyors. The goods came out in good condition and the method was so simple we all wondered why we had not thought of it long before.

Some of the goods needed soaping and it was just as easy to run them out of the trucks into the soaper as it was out of the pit. We put a division in the center of the soaper and had soap in one end of the machine and water in the other end. We were very careful to have the goods properly wet out coming off the singeing machine. We used a little soda along with the water and tried to have the machine a day ahead of the kiers. The soda in the goods broke up the dressing and oil spots. If this apparatus is installed I am sure nothing but good results will be obtained.

A YARN DYEING MACHINE

A machine for dyeing yarn, shown in the accompanying illustrations, has recently been patented in this country. It is described by the inventor as follows:

The machine provides an improved means for reciprocating the slats so that during the treatment of the yarn while on the beam, the dye liquor and washing fluid have free access to the yarn immediately next to the slats. Any streaky effect, due to continuous contact of the yarn with the slats, incident to the dyeing, washing, or other treatment of the yarn, is thus avoided.

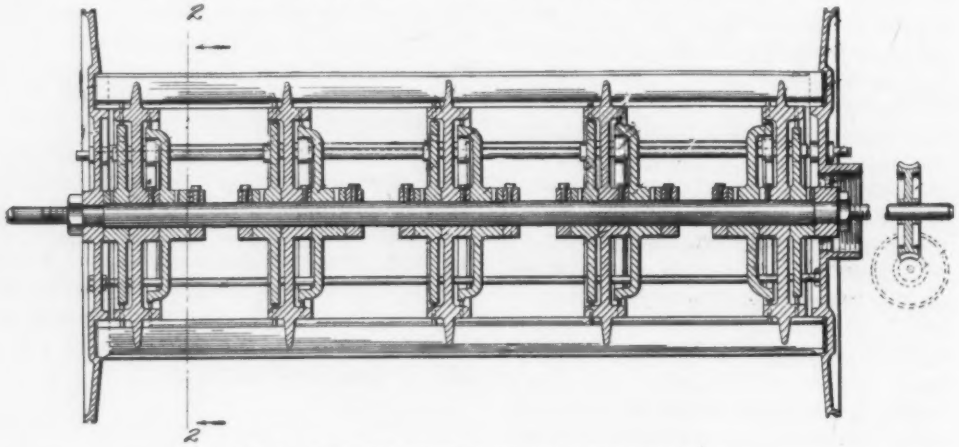


FIG. 1. A CENTRAL VERTICAL SECTION OF THE APPARATUS.

Fig. 1 shows a central vertical section through the apparatus, along the line 1—1 of Fig. 2. Fig. 2 is a cross-section along the line 2—2 of Fig. 1, and looking in the direction of the arrows.

The warper beam consists of a skeleton frame, having two heads provided with beveled flanges beyond the slats. These heads are mounted on a shaft, which is journaled in the containing vessel.

The slats, made of wood with tapered outer edges, extend between the heads and pass through guideways between the wedge-shaped lugs of the rings, which are carried on spiders shown in Fig. 1. Each slat is provided with a series of metal pins secured on the side next the shaft. These pins project through holes in the rings and permit the slats to have a radial movement.

Loosely mounted on each side of the spiders are spiders which are held between the set collars and spiders. Each of these two spiders has its periphery provided with a series of cam teeth, having a circular outer portion and wedge faces. They are also provided with racks, engaging pinions, mounted on a shaft to one end of which a crank can be attached. By turning the

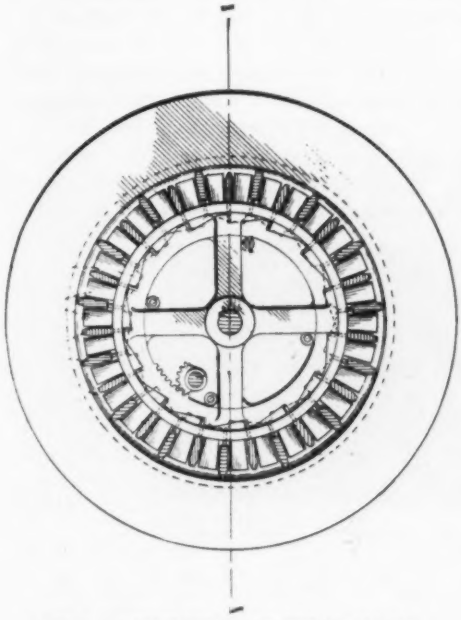


FIG 2. A CROSS SECTION OF THE APPARATUS.

crank in one direction, one set of pins is caused to ride up on the curved portions of the cam teeth, and the other set will be free to project into the grooves between the teeth. The tension of the yarn wound on the warper beam would normally tend to press the teeth inward, so that they will readily move inward when released. Fig. 2 shows one set of slats forced outward, and the adjacent set forced inward. Projecting between the arms of the various spiders are tie rods to secure the heads. These should be so arranged as not to interfere with the motion of the spiders, as shown in Fig. 2.

By a small angular movement of the hand crank all of the cam teeth on each pair of spiders are forced outward, the pins of adjacent pairs of slats are released. Thus the shifting of the position of the slats may be very quickly and conveniently accomplished.

GREEN STAINS ON COTTON CLOTHS

BY HADDON

The habit of jumping at conclusions, which is generally more pronounced when knowledge of a subject is limited, often causes serious trouble. I had recently become connected with a mill when considerable trouble was occasioned by the appearance of green stains in the finished goods as they came off the tentering machine. It so happened that a new grade of China clay had recently been introduced, so that the green stains and China clay supplied enough circumstantial evidence to lead the finisher to start the ball rolling. The jobber who had furnished the China clay received a scorching letter which brought him on a hurried trip from his office in a distant city. Being unfamiliar with actual finishing, he looked at the goods finished prior to the time of the introduction of his product, and then at the stains which had recently appeared, shook his head and promised to demand an explanation from the man who sold him the goods. Just then I happened to come into the office, and heard of the trouble for the first time. I told the jobber that I was sure there was nothing in the composition of China clay to cause green stains on bleached goods. This eased his mind somewhat, but failed to solve the problem.

Going into the finishing room I examined the tentering machine, which had been in use for some years, and observed that the rolls were made of brass, nickel-plated. The nicket plating had begun to wear off, leaving portions of the brass exposed. Knowing that starch was likely to contain acid, a boil was tested with litmus paper and a decidedly acid reaction was noticed. Here was a case of an acid starch corroding the exposed brass on the rolls with the formation of copper compounds with their characteristic green color. By the addition of a small amount of soda ash to each boil the

acid was neutralized and the green stains disappeared.

The coincidence of a change in China clay just at the time that the nickel-plating was wearing off the rolls resulted in a hasty jump at conclusions which might have made considerable trouble and caused a long delay in getting at the real cause of the damage.

THE "PREIN" FINISHING PROCESS FOR TEXTILES

From the Zeitschrift fuer die gesamte Textil-Industrie.

Translated from the German by the Editor of the Textile World Record.

It is well known that the linen fabrics of the ancient Egyptians possess qualities that are lacking in modern fabrics in spite of the great advance in the methods of manufacturing textiles. Our finest cloths do not approach the quality of the old Egyptian cloths made eight thousand years ago and in which the mummies are wrapped. It is evident that the Egyptians must have possessed better raw material or used a different method of spinning and weaving. In no other way can the superiority of their fabrics be explained.

The Egyptian weavers did their work at the loom while squatting on the ground. Originally their weaving apparatus was placed in a horizontal position and later was set vertical as shown in the illustration, Fig. 1. Inscriptions older than the one shown, which have been found on Egyptian tombs show invariably the looms set horizontally. These old illustrations show jars of water set near the loom and used for moistening the yarn. This practice of watering the yarn during weaving is customary with all ancient races. The illustration, Fig. 1, shows the yarn being placed in the water jar and then removed and squeezed by the worker, No. 5. The illustration makes it

FIG. 1. SHOWING THE YARN BEING PLACED IN THE WATER JAR, REMOVED AND SQUEEZED

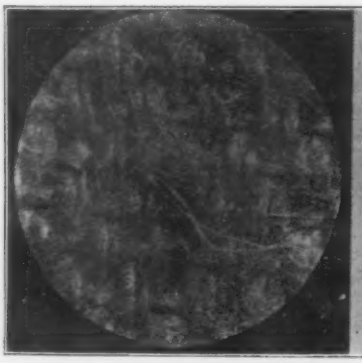


FIG. 2. A LINEN SAIL CLOTH MADE BY THE ORDINARY PROCESS

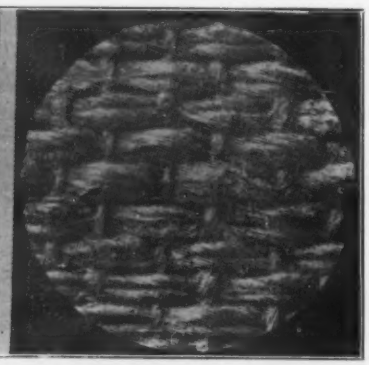


FIG 3. SAMPLE OF FABRIC SUBJECTED TO THE "PREIN" PROCESS

certain that the yarn was moistened preparatory to weaving on the loom shown at No. 2. It is equally evident that the material was moistened in order to produce a finer and smoother fabric free from projecting fibers. As a matter of fact the old Egyptian fabrics show a smooth face free from fuzz. It is this old Egyptian process that has been revived by Herr Prein of Hanover and patented in eleven countries. The Prein process consists in applying water and a sizing material to the yarn during weaving by means of a very simple device attached to the loom. As a result all the fibers are laid

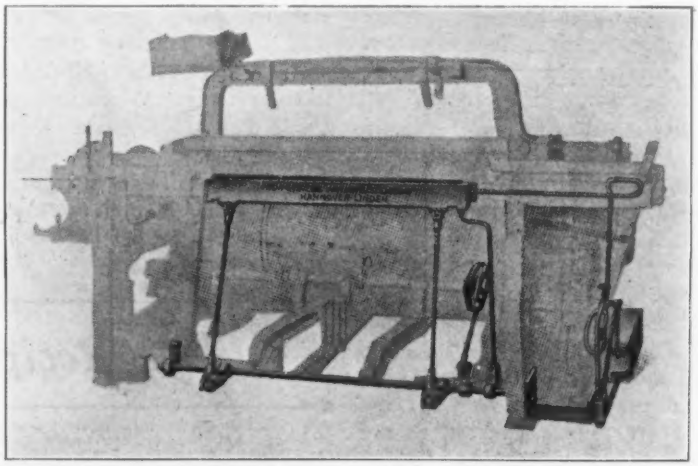


FIG. 4. ATTACHMENT USED FOR APPLYING THE SIZING MIXTURE TO THE YARN.

firmly on the thread making it unnecessary to shear or singe the cloth during the process of finishing.

The improvement is shown at Figs. 2 and 3, the former being a linen sail cloth made by the ordinary process. Fig. 3 is a sample of a fabric which has been subjected to the Prein process. As it is not necessary to remove any of the fiber from the cloth during the finishing, the fabric finished by the Prein process is stronger and more durable and possesses a better handle. The attachment used for applying the mixture and sizing to the yarn on the loom is shown at Fig. 4. A rubber sponge is mounted on a vibrating frame operated from the loom shaft. By means of this device the sponge to which water and sizing is supplied comes in contact with the under side of the warp when the harness are lowered. The filling is also moistened by a suitable arrangement consisting of a sponge set in the shuttle. Means are provided for drying the cloth on the loom.

BACK FILLED GOODS

BY PARMA

I have recently had a number of complaints regarding goods not being heavy or stiff enough. I have found that in most cases it was due not to the finishers not knowing what finishing materials to use, but to the want of a proper knowledge of how to handle the starch mangle or back filling machines. I was called into a place once where they were finishing silesias, satin sleeve linings, sateen pocketings, twill pocketings, unbleached drills, duck linen and hollands. The finisher could not get the goods stiff enough. I went into the store room and found he had dextrine, corn, potato and wheat starch, epsom salts, glauber salts, gum arabic, china clay, mineral white, talc and tapioca flour. The man seemed to know his business so I went to the machinery end to try and find out the cause of the difficulty there. There was a starch mangle with a wooden roll in the bottom and a brass roll on top. I asked the finisher if he

had ever tried two wooden rolls. He told me he had to take the wooden roll off the top and put the brass one in because when heavy finishes were required the cylinders got all covered with starch and he would have to stop and wash them. Since he got the brass roll in he did not have to wash up so often. He told me he had to run the goods sometimes four times to get them stiff enough. I explained to him that there was no use in making a heavy mixing and then cut it off with the brass roll. I explained that the best thing to do was to take the brass roll off and put on a doctor or brass plate, or in other words, make it into a back filler machine.

The finisher called up the repair man and I told him what was wanted. In about three hours' time we got some chain blocks and lifted out the brass roll, put the doctor in and it being too late to run any more work that night I had the faces of the drying cams or cylinders oiled with cocoanut oil. When one of the men saw what I was doing he called out that we would not get the thing started for a week for we would have to wipe all the oil off again before the machine could be started. The next morning I got a piece of thin muslin and covered the first three cylinders that went over the back of the goods. Then I got four pieces out of the grey room and run them through water once. The dry machine stopped on the last end and I had the goods stitched in and then put in the starch mixture and set the doctors. Everything worked all right. The superintendent told me he used to run this kind of goods three times and now they were just as stiff with one run. The finisher thought this method would go all right for a time, but that the cylinders would get covered up with starch, but they ran until noon without any difficulty.

During the noon hour I had the cylinders oiled again. In the afternoon we started up with a gray batch and everything went along smoothly. We did all the heavy finishing this way and then had the brass roll dropped into place again. This time I put a cover of muslin on top of the brass so they could have their pick of the back filler, the covered brass roll or the wooden roll. The doctor or brass plate cost a little less than $20. They had an upright drying machine with 44 cylinders, 4 sets of 11 cylinders each, with a one-inch steam pipe running into each set with a steam trap on the opposite side. I had them cut out the trap on the set next to the folders and carry the outlet pipe across the bottom into the next set. I did the same with the next two sets and cut the steam out of the three first cylinders that take the back of the goods, inserting a piece of sheet iron at the joints of the inlet and outlet on each cylinder.

My experience has been that when heavily starched goods are to be put through it is well not to have the front cylinders as hot as the others. This helps to keep the starch from sticking. When the cylinders become covered with the starch mixture use a scraper the same as painters use. Then use sandpaper and after that use a mop dipped in cocoanut oil and start up with a gray batch.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 121

RED ON WORSTED DRESS GOODS

Red on 100 lbs. worsted dress goods. Prepare the dye bath with

6 oz. 314 gr. Amazo Brill. Red 2 B.
1 oz. 402 gr. Fast Yellow L R.
1 oz. 402 gr. Fast Pink Y.
(American Dyewood Company, 80 Maiden Lane, New York.)
2 lbs. Oil of Vitriol.
20 lbs. Glauber's Salt.

Enter at 120° F., bring to boil in 20 minutes, boil 1 hour or to shade.

The colors used to produce this shade are recommended for their excellent level dyeing properties and good fastness to light, and can be used satisfactorily on all classes of wool.

Recipe No. 122

BLUE ON WORSTED DRESS GOODS

Blue on 100 lbs. worsted dress goods. Prepare the dye bath with

7⅜ oz. Amazo Blue.
1 lb. 6 4/5 oz. Amazo Violet 4 B O.
1 oz. 228 gr. Amazo Fast Yellow L R.
(American Dyewood Company, 80 Maiden Lane, New York.)
3 lbs. Sulphuric Acid.
20 lbs. Glauber's Salt.

Enter at 120° F., bring to boil in 20 minutes, boil 1 hour or to shade.

The colors used to obtain this blue are of good fastness to light and have excellent leveling properties, being also recommended for all classes of wool dyeing.

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Recipe No. 123

BLACK ON WORSTED YARN

Kresol Black S 3 B on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Kresol Black S 3 B.
(Geisenheimer & Co., 189 Front St., New York, N. Y.)
20 lbs. Glauber's Salt (Crystal).
5 lbs. Formic Acid.

Enter at 140° F. and dye at a boil for 3/4 of an hour, then add

2 lbs. Sulphuric Acid

and continue boiling 1/2 hour to exhaust the bath.

Kresol Black S 3 B does not stain white cotton threads, and possesses especially good level dyeing and penetrating properties.

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Recipe No. 124

BLUE BLACK ON WORSTED YARN

Salicine Blue Black K on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Salicine Blue Black K.
(Kalle & Co., 530 Canal St., New York, N. Y.)
8 lbs. Acetic Acid.

Enter at 100° F., dye at a boil for 3/4 of an hour, then add

1 lb. Sulphuric Acid

and continue the boiling 1/4 hour longer, to exhaust the dye bath. Then afterchrome at a boil for 1/2 hour in a bath containing

1½ lbs. Potassium Bichromate.

Salicine Blue Black K possesses very good fastness to light and washing.

Recipe No. 125

ORANGE RED ON WORSTED YARN

Orange Red G R Special on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Orange Red G R Special.
(Cassella Color Co., 182 Front St., New York, N. Y.)
18 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F. and dye at a boil for one hour.

Orange Red G R Special produces a remarkably brilliant and clear shade of orange red, and will be found to dye very level.

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Recipe No. 126

BROWN ON WORSTED YARN

Autochrome Brown A G on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Autochrome Brown A G.
(Farbwerke Hoechst, 122 Hudson St., New York, N. Y.)
2 lbs. Bichromate of Potash.
20 lbs. Glauber's Salt.

Enter at 120° F., raise slowly to a boil and after boiling 3/4 hour add

2 lbs. Acetic Acid

and after another 3/4 hour boil, wash thoroughly.

Autochrome Brown will be found to give a very desirable brown particularly for the dyeing of loose wool.

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Recipe No. 127

GREEN ON COTTON YARN

Paranil Green G on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Paranil Green G.
(Berlin Aniline Works, 213 Water St., New York, N. Y.)
20 lbs. Glauber's Salt (Crystal).
2 lbs. Soda Ash.

Dye at 200° F. for an hour, then rinse. Dyed yarn is then coupled by working in cold water bath for twenty minutes made up as follows:

2 lbs. Paranitraniline.
4½ lbs. Concentrated Hydrochloric Acid.

On stirring complete solution takes place. Pour the solution slowly while stirring well into

7 gals. Water as cold as possible.

The Paranitraniline thereby separates out again. The temperature of the mixture must not exceed 70° F. Then add a solution of

1 lb. Sodium Nitrite in

½ gal. Cold Water

and stir. Complete solution takes place. After about twenty minutes pour the solution through a piece of cloth into the developing bath and finally add

4½ lbs. Sodium Acetate Cryst.

dissolved in about 2 1/2 gallons of water.

Paranil Green B possesses good fastness to washing and in general the properties characteristic of direct cotton colors.

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Recipe No. 128

BLACK ON WORSTED YARN

Neotolyl Black V L on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Neotolyl Black V L.
(Farbwerke Hoechst, 122 Hudson St., New York, N. Y.)
20 lbs. Glauber's Salt.
4 lbs. Acetic Acid.

Enter at 100° F., raise to a boil and boil 3/4 of an hour. If bath is not then exhausted add an additional 3 lbs. Acetic Acid and continue boiling for 1/2 hour.

Neotolyl Black when applied in this manner dyes level and will be found a valuable black for all branches of wool dyeing.

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Recipe No. 129

BLACK ON WORSTED YARN

Salicine Alizarine Black P V K Extra on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Salicine Alizarine Black P V K Extra.
(Kalle & Co., 530 Canal St., New York, N. Y.)
8 lbs. Acetic Acid.

Enter at 100° F., dye at a boil for 3/4 of an hour, then add

1 lb. Sulphuric Acid

and continue boiling 1/4 hour longer to exhaust the dye bath, then add

1½ lbs. Potassium Bichromate

and boil 1/2 hour longer.

Salicine Alizarine Black P V K Extra possesses very good fastness to light and washing.

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Recipe No. 130

YELLOW ON WORSTED YARN

Milling Yellow 3 G on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Milling Yellow 3 G.
(Berlin Aniline Works, 213 Water St., New York, N. Y.)
10 lbs. Glauber's Salt (Crystals).
3 lbs. Acetic Acid.

Enter at 120° F., raise to a boil during 1/2 hour and dye at a boil for 1/2 hour. Then add

2 lbs. Acetic Acid

and boil 1/2 hour longer or until the bath is practically exhausted.

Milling Yellow 3 G dyes wool in a mildly acid bath, with after chroming, giving very good fastness to washing, and good fastness to light and milling. Its fastness in these respects, however, is improved somewhat if it is afterchromed, or used as a metachrome color.

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Recipe No. 131

BROWN ON UNION CLOTH (COTTON AND WOOL)

Union Brown No. 7835 on 100 lbs. union cloth. Prepare the dye bath with

2 lbs. Union Brown No. 7835.
(Innis Speiden & Co., 46 Cliff St., New York, N. Y.)
40 lbs. Glauber's Salt (Crystals).

Enter at 100° F., work at this temperature for 20 minutes, then raise to a boil and boil 20 minutes. Shut off heat and allow to cool in the bath for 20 minutes.

Union Brown No. 7835, when applied by this method, will be found to be an excellent color for the dyeing of cotton and wool union material.

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Recipe No. 132

BLUE ON UNION CLOTH (COTTON AND WOOL)

Union Blue No. 2322 on 100 lbs. union cloth. Prepare the dye bath with

3 lbs. Union Blue No. 2322.
(Innis Speiden & Co., 46 Cliff St., New York, N. Y.)
40 lbs. Glauber's Salt (Crystals).

Enter at 100° F., work at this temperature for 20 minutes, then raise to a boil and boil 20 minutes. Shut off heat and allow to cool in the bath for 20 minutes.

Union Blue No. 2322, when applied by this method, will be found to be an excellent color for the dyeing of cotton and wool union material.

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The "tree of life" seen so often in Persian rugs is always a religious symbol. The tree is generally a cypress, because this tree typifies immortality, its wood being so little affected by the progress of time. Cypress trees are very common in Oriental countries.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Heating Plates for Drying Machines. E. C. Foerster, 176 State St., Flushing, N. Y., American representative. The Posas steam heating plate is a comparatively recent German invention, which is now being used quite extensively on the continent in connection with heating and air drying machinery, as well as regular heating work. This plate takes the place of coilers and gives a larger and more economical radiating surface, occupying very small space in proportion to the radiating surface, and is claimed to greatly increase the efficiency for given expenditure of fuel. These steam plates, combined with adequate circulation of the air, are used effectiveiy in drying frames, tentering machines and drying apparatus of various kinds.

Aspirator for Cotton Combs. J. Weinbrenner & Co., 1048 Old South Bldg., Boston, Mass. An improved apparatus for removing the waste from cotton combs during the operation of the machine. The waste is removed by a suction of air induced by a separate fan for each machine.

Winding Yarn for Dyeing. Gebrueder Sucker, Gruenberg, Schlesien, Germany. An apparatus for winding yarn on beams preparatory to dyeing in a centrifugal machine. It is claimed that the yarn is wound in such a way as to ensure a uniform circulation of the dye liquor through the yarn.

An Improved Finishing Process. The Prein-Gewebe Actien Gesellschaft, Hanover, Germany. A method of treating textiles during the process of weaving. It consists in the use of a vibrating brush or sponge which coats both the warp and filling with a sizing solution, at the same time moistening the yarn. It is claimed that by this means the loose fibers are laid on the thread and prevented from projecting as is the case with untreated fabrics. It is also claimed that it is unnecessary to shear or singe cloths that have been treated by the "Prein" process. A reference to this process appears in another part of this issue.

Cop Winder. Duckett, Morrison & Co., Stalybridge, England. An improved cop winder which winds a cop on the lines of the ordinary mule cop by a quick return action of the thread guide.

Stop Motion for Ring Frames. Peter Thieron & Son, Zwirnmaschinenfabrik, Eupen, Germany. A stop motion for the top rolls of ring twisting frames, which operates when the thread breaks.

Plush Loom. The Saechsischen Webstuhlfabrik, Chemnitz, Germany. A device for inserting and removing the pile rods of plush looms.

Fulling Mill. L. P. Hemmer, Aachen, Germany. An improved fulling mill which is designed to prevent mill wrinkles forming in the goods.

Thread Guide and Tension Device. Peter Thieron, Eupen, Germany. A thread guide for twisting machines, which also serves to keep the yarn under uniform tension.

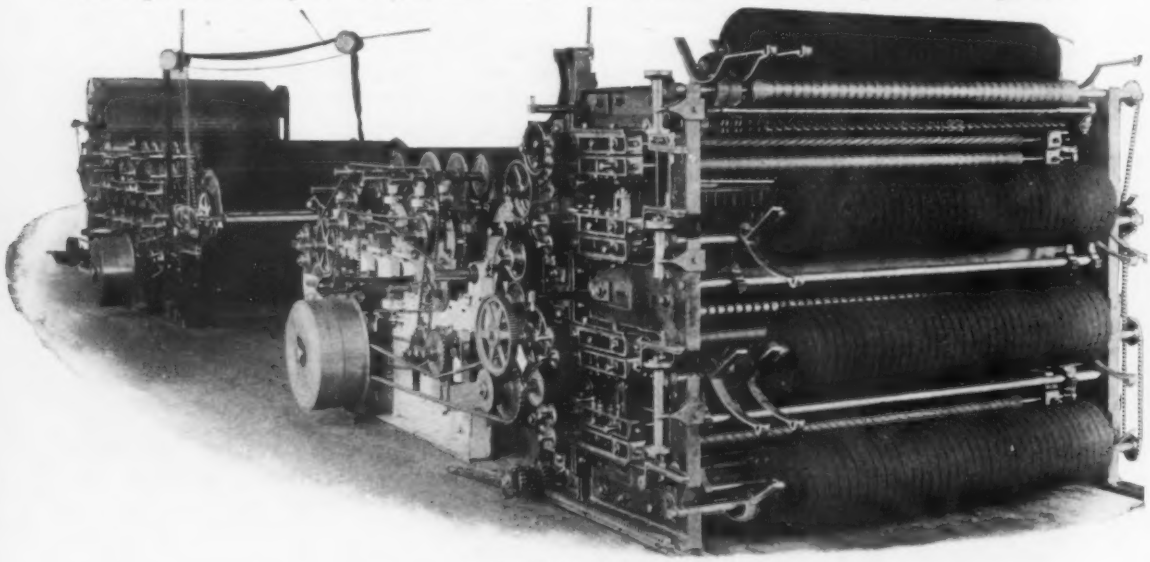
Rotary Press. Rudolph & Kuehne, Berlin, Germany. A two-cylinder rotary press for wool goods. The upper cylinder rests on and bed in the ordinary manner, while the bed in turn rests on the lower cylinder. In this way the cloth is subjected to two pressings at one passage through the machine.

A NEW SYSTEM OF CARDING

The Woonsocket Machine & Press Co., Woonsocket, R. I., have developed, and are now putting on the market a line of carding machinery which is particularly adapted for cotton waste, shoddy and wools.

The set of machines comprises a double breaker and a finisher card, taking off 140 ends. The large number of ends taken off naturally results in a great increase of production.

It will be noted by the illustration that the large cylinder, which has been a feature of carding machines up to the present time, is absent in this system, yet the carding surface is greater.



A NEW CARDING MACHINE

The great number of carding points results in the stock being thoroughly carded.

The machines are ruggedly and compactly built and simplicity and efficiency of design has been the aim of the builders. A set of the machines is now in operation at the works at Woonsocket, R. I., and may be inspected by interested parties. Many manufacturers have availed themselves of the opportunity.

Japan's exports of raw and manufactured silk now aggregates about $100,000,000.

WATER SOFTENING APPLIANCES

By C. R. TROWBRIDGE of the Dodge Manufacturing Co.

In most parts of the United States hard water is well known as the only kind directly available. The householder has to struggle with this inconvenient substitute for pure water, but the engineer regards it as the bane of his existence, causing the boilers to be coated with scale, increasing the coal bills, reducing the capacity of the power plant, and shortening the life of the equipment. If there was nothing but pure water delivered into the boiler the conversion of its contents from the liquid to the gaseous state would leave the interior of the generator in the same condition in which it was originally made. If, however, as is usually the case, the liquid introduced into the boiler contains solid matter in suspension and various salts in solution, these substances, not being evaporated by heat, will be left behind, and thus will accumulate to cause trouble and ultimate disaster.

Various methods have been devised to remove the accumulations of sediment and coatings of scale from the interior of boilers which are fed with impure water. Some are fairly effective, while others are worthless, but all of them are based upon the defective

principle of endeavoring to take out of the boiler things which should never have been permitted to get into it.

Water which is called "hard" has in solution certain salts of calcium and magnesium, especially their carbonates and sulphates. These are thrown down by the action of heat, and thus cause the formation of hard scale upon the interior surfaces of the boiler, depriving it of the protection of the water and impeding the transfer of heat. When, in addition, the water contains clay or mud in suspension, this solid matter is gradually permitted to settle and become baked upon the boiler sheets, thus combining with the scale to make trouble. Both mud and scale are notable examples of the inconveniences due to substances in the wrong place, and the obvious remedy is to put them somewhere else.

We thus come to the positive rule that the proper way to keep a boiler clean is to put only clean water into it. If the water contains mud which will settle in the boiler, give it a chance to settle somewhere else. If it contains carbonates, which are precipitated by temperatures which exist in the boiler the right thing to be done is to raise the temperature of the water to the precipitation point in advance and let the separation be done outside the boiler. If the water contains sulphates, forming hard scales in the boiler, the reasonable treatment is to add to the water sufficient lime and soda to convert these constituents into carbonates, so that they may be got rid of with the rest.

Mud, clay and other materials, which are held in mechanical suspension, may readily be separated by furnishing time and opportunity for settling, thus enabling them to be blown off outside the boiler.

All these facts are well known, but, like many other facts, they are utilized only by people who understand the importance and value of employing them. The competent power-plant engineer, however, realizes that an essential portion of his equipment is an effective water-softening and purifying equipment, while the railway superintendent of motive power installs at every watering station an outfit which will insure the supply of pure water to his locomotives and minimize the delays and losses otherwise caused by burnt sheets and tubes and diminishing steaming power of his engines. Any boiler which becomes choked with mud and coated with scale is proof of the neglect with which it has been treated, a neglect which is all the more reprehensible because it is so wholly unnecessary.

A NEW LABOR-SAVING STOREHOUSE

For some years the mills of the Ludlow Manufacturing Associates on the Chicopee River have been served by storehouses one story high, and measuring about 40 by 150 ft. Land was very cheap and the storehouses were scattered over an area of twenty-three acres. They were so spaced that not more than one-third of the land area was covered by buildings. To connect these storehouses with the mills an extensive system of trackage was used, amounting in all to more than ten miles. The jute bales were stacked in the storehouses twenty feet high. It is obvious that the expense of handling was very heavy.

To overcome this expense and also to accomplish certain improvements in the fire risk, Charles T. Main, engineer, Boston, was commissioned to develop another type of storehouse which would do away with most of the manual labor of handling goods. The result is an eight-story building, 215 by 68 ft., built of brick with concrete floors and mill construction roof. This is arranged for practically automatic handling of materials by means of paddle conveyors and a spiral chute conveyor, three of the former connecting the storehouse with the new No. 11 mill building 57 ft. distant, across two railroad tracks.

The new building has two end sections for storage, each 100 ft. long. Between them is a 13-foot conveyor building running right across. The conveyor building is separated from the storage sections by heavy solid brick walls with tin-covered fire doors, operated automatically, at each opening.

The interesting feature of this storehouse is the method of delivering raw stock from

the storehouse to the mill and then delivering finished goods from the mill to the lower floor of the storehouse. The storehouse, which runs almost due east and west, is located on the south side of State St., Ludlow, and has a 7-foot concrete platform alongside a track on the edge of that street. Stock is delivered across this platform into a 45° conveyor which carries it up and dumps the bales, weighing about 400 lbs. each, at any floor desired. The bales slide on the two bars forming the base of the conveyor and are shoved along by paddles carried on two endless chains operated on wheels driven by an electric motor.

On account of the inclination of this conveyor much difficulty was experienced at first in arranging a baffle for each floor which would positively throw the bale off the conveyor without either toppling it over backwards down the conveyor or catching the lower corner of the bale between the paddle and the baffle. After a considerable amount of experimenting with a conveyor and a series of baffles a curve was developed which would give the desired result, and this has now been fitted as a baffle to all the floors for this purpose.

Bales to be delivered to the mill are taken from the store room into a spiral conveyor eight feet in diameter, located at one end of the central conveyor building. By this means the bales are conveyed by gravity to a power conveyor at the third floor, which carries them across two platforms and two railroad tracks to the new No. 11 mill where the stock is delivered on the first floor. In a similar way gravity chutes from the fourth and fifth floors of the mill carry finished goods to the first floor of the storehouse where they are held until shipped from the platforms on either side of this building. This new storehouse has a capacity about equivalent to thirty of the older single-story buildings. Each section has capacity for 2,500 bales of jute, or 500 tons. The total capacity on the seven floors devoted to storage of raw stock is 35,000 or 7,000 tons.

The same capacity in buildings of the type previously used could have been provided for a figure 25 per cent. under the cost of the new storehouse and conveyors. The cost of operation, however, including labor and power, would have been so great as compared with the cost under the new conditions that it would not have paid to have put in the cheaper arrangement. In other words, the difference in operating cost will much more than offset the difference in interest and depreciation charges on the excess cost of the new building. This is entirely in addition to incidental advantages, such as improved fire risk, economy of ground space, etc.

A CENTRAL LIGHTING PLANT FOR TEXTILE MILLS

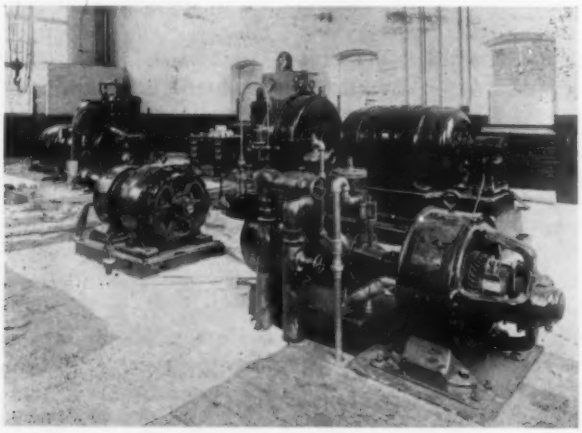
The Lonsdale Company, which operates several large textile mills in and about Lonsdale, R. I., has recently put in operation a new steam plant for lighting the Ann & Hope Mill, No. 4 Mill and Bleachery at Lonsdale and the Ashton Mill at Ashton. By this arrangement current is available for lighting or auxiliary power purposes at times when the steam or water power plants at each mill are shut down. Furthermore, a general system of lighting for the villages can be developed as desired.

The present generators consist of two Westinghouse turbo-alternators of 250 kv-a. and 375 kv-a. capacity respectively. These machines run in parallel at a speed of 3600 r. p. m. and furnish three phase energy at 2300 volts, 60 cycles. A 10 k. w. exciter is used for starting, driven by a small vertical steam engine. For continuous running a 20 k. w. motor-generator set is used, drawing alternating current from the switchboard. The two exciter sets appear in the foreground of the interior view.

The turbines operate under a 150 lb. steam pressure and exhaust into a single LeBlanc low level jet condenser which is capable of maintaining a 26 inch vacuum when handling 14,500 lbs. of steam per hour.

The water supply for the station is taken from the power canal supplying the mills and flows by gravity to a concrete suction well. From this well the boiler feed pump can draw if necessary, although when the

turbines are running the boiler feed water is taken from the condenser discharge.



INTERIOR VIEW OF THE TURBINE ROOM

THE OUTER VIEW OF THE POWER PLANT

Should the condenser stop, however, or fail to supply enough water for the boilers, the feed pump immediately draws from the cold well. This change is provided for by a very simple arrangement of piping and takes place automatically without the manipulation of any valves. Before entering the boilers, the feed water passes through a closed heater and a Green economizer.

The first installation of boilers consists of

two vertical Corliss boilers 85 inches in diameter, rated at 223 h. p. each, good for 185 lb. pressure. These are set on 10 foot centers and space is provided for two more. Draft is furnished by a brick chimney, 125 feet high and 5 feet in diameter, built after the characteristic design of the engineers, Messrs. Lockwood, Greene & Co. of Boston.

The power house is built of red brick and measures 69 feet by 55 feet outside, the space being about equally divided between the generator and boiler rooms. There is a high basement under the turbine room used for the condenser, heater and pumps. Access from the boiler room is facilitated by having the floors on the same level.

Ample provision has been made in the building and in the size of the chimney for adding equipment for either light or power up to double the capacity of the present installation.

Coal is received on railway cars and dumped into a pocket close to the boiler house, from which it is wheeled across a concrete slab to the firing floor.

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HYDROGEN PEROXIDE AS ANTICHLOR

BY R. C. STAUBER

From Deutsche Faerberzeitung

Besides being a well-known bleaching agent, hydrogen peroxide is also an excellent agent for removing from the material the last traces of chlorine after bleaching. The oldest antichlor is the hyposulphite of soda of photography, which forms with the chlorine sodium chloride and sulphuric acid. Hence when it is employed, careful washing must follow to eliminate the sulphuric acid, which might otherwise shorten the life of the fibers and color them brown. Another disadvantage of hyposulphite of soda is that it gives the material a yellowish color. It has been often asserted that the coloration is attributable to the indiscriminate use of the hyposulphite, which is a powerful reducing agent and partly counteracts the oxidizing effect of the chlorine, the fibers being thus partly restored to their original color.

An antichlor also frequently employed just now is sodium bisulphite ($NaHSO_3$). This is oxidized by the chlorine into sodium sulphate. This must also be removed by careful washing, for an excess of the bisulphite must of course be employed to be afterwards again washed out. A certain quantity of the bisulphite is thus wasted. If the washing be deficient, it is certain that the bisulphite remaining will be quickly converted into the sulphite with production of sulphurous acid, as can be determined by the smell. Under the action of the air sodium sulphite changes into the sulphate, which has no detrimental effect, but the sulphurous acid forms with the moisture of the air sulphuric acid, which has a decidedly injurious effect on the fibers. Finally, since the bisulphite must be employed in excess, it acts not only as an antichlor but, like the hyposulphite, though in a somewhat less degree, counteracts the bleaching effect obtained by the chlorine.

Hydrogen peroxide obviates these defects; it renders the chlorine compounds which remain in the pulp after bleaching quickly and surely innocous, without itself producing any detrimental effect on the fibers. The oxygen of the hypochlorite escapes with the active oxygen of the hydrogen peroxide into the air. Technically there is no drawback in employing an excess of this antichlor, which then simply completes the bleaching; owing to the cost, however, an excess will naturally be avoided. It has been proposed to begin bleaching with a weak solution of chloride of lime and to complete it with hydrogen peroxide, which acts simultaneously as an antichlor for the first bleaching.

The employment of hydrogen peroxide in this way was first proposed by Prof. G. Lunge of Zurich. The drawbacks of the process are, firstly, that difficulties arise in storing the hydrogen peroxide, and secondly, the cost; the latter point has, of course, much less weight if this agent is employed only to complete the bleaching.

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The cotton knit goods exported to the Philippine Islands from the United States during April, 1913, amounted to $9,791, as compared with $1,507 in April, 1912.

Personals

E. C. Sherman, superintendent of the Dexter Yarn Co., Pawtucket, R. I., has severed his connection with that company.

Frank O'Bryan has accepted the position of overseer of finishing at the Fort Plain Knitting Co., Fort Plain, N. Y. He comes from Utica, N. Y.

G. E. Schermerhorn is superintendent of the spinning department at the Chipman Knitting Mills, Easton, Pa.

Frank Stiner has accepted the position of overseer of finishing at the Ashtabula Worsted Co., Ashtabula, Ohio. He was formerly employed at the Allen Woolen Co., Rochester, N. Y.

William Heathcock, overseer of spinning at the Chicopee Manufacturing Co., Chicopee Falls, Mass., has resigned to become superintendent of the Tremont & Suffolk Mills, Lowell, Mass.

C. R. Blake, for a number of years superintendent of the Tremont & Suffolk Mills, Lowell, Mass., has severed his connection with that company.

Rudolph Mueller, overseer of finishing at the Ashtabula Worsted Co., Ashtabula, O., has resigned.

William F. Rawley has been appointed superintendent and designer of the Dumbarton Woolen Mill, Dexter, Me.

John C. Shaw, superintendent of departments 9 and 10 at the New Bedford Spinning Co., New Bedford, Mass., has severed his connection with that company.

David Seddon has been promoted to the position of overseer of mule spinning at the Butler Mill, New Bedford, Mass. He formerly held the position of second hand in the spinning department for this company.

Alexander Nicholson, designer at the Crown Mill, Marcellus, N. Y., has tendered his resignation. He is succeeded by Frank Scoon, formerly designer at the Earnsdale Worsted Co., Clinton, Mass., but more recently with the Abbotsford Worsted Co., of Clinton.

Moses Louder has been appointed overseer of finishing at the Orr Felt & Blanket Co., Piqua, O. He was formerly overseer of finishing at the same company in the worsted department, but has recently been with the Brickner Woolen Mills, Sheboygan Falls, Wis.

Trubee Burrow, overseer of dyeing at the Pawtucket Hosiery Co., Pawtucket, R. I., has severed his connection with that company.

Charles E. Keency has been appointed overseer of finishing at the Hockanum Mills Co., Rockville, Conn., to succeed James Kelly.

James Kelly has accepted the position of overseer of finishing at the Hoosac Worsted Co., North Adams, Mass. He was formerly employed employed at the Hockanum Co., Rockville, Conn.

R. C. Collier, superintendent of the Collier Manufacturing Co., Barnesville, Ga., has resigned to accept a position with the Huntsville Knitting Co., Huntsville, Ala.

Joseph D. Price, overseer of dyeing at the Amos, Abbott Co., Dexter, Me., has resigned owing to this mill being closed on account of the dullness of trade. He has secured a position as overseer of dyeing with the Squamlake Woolen Co., Ashland, N. H. This mill makes government goods. Mr. Price being an expert on indigo dyeing, his long experience in that line will make him a valuable man for this company.

Joseph Utley, overseer of weaving at the Roxbury Carpet Co., Boston, Mass., has retired, after having completed his fiftieth year in the employment of the concern.

Allen McNabb has been appointed general manager of the Lancaster Mill, Clinton, Mass. He was formerly employed in one of the mills operated by B. B. & R. Knight of Rhode Island.

George F. Brietz, superintendent of the Lumberton Cotton Mill, Lumberton, N. C., has resigned to accept a similar position at the Kinston Cotton Mill, Kinston, N. C.

J. W. Engle has accepted the position of overseer of carding at the Hamilton Carhartt Mill, Rock Hill, S. C. He comes from Roanoke Rapids, N. C.

J. W. Manley has been appointed superintendent of the Manetta Mills, Lando, S. C. He comes from Winston-Salem, N. C.

J. P. McGraw has accepted the position of overseer of weaving at the Highland Park No. 1 Mill, Charlotte, N. C. He comes from Rockingham, N. C.

E. C. Winston, formerly overseer of carding and spinning at the Pearl Mills, Durham, N. C., has resigned to accept the position of assistant superintendent at the Little River Manufacturing Co., Willardville, N. C.

R. L. Armstrong has accepted the position of overseer of carding and spinning at the Lancaster Cotton Mill No. 3, Lancaster, S. C. He comes from Concord, N. C.

H. J. Crytz has accepted the position of overseer of carding and spinning at Newton, N. C. He comes from Lincolnton, N. C.

J. P. Hornbuckle has been appointed superintendent of the Minneola Mill, Gibsonville, N. C., to succeed Z. H. Mangum.

Frank Hammond, president of the Westervelt Mill, Greenville, S. C., has resigned on account of ill health.

Arthur Lemire has accepted a position as overseer of spinning at the Renfrew Manufacturing Co., Adams, Mass. He was formerly employed at the Boott Mill, Lowell, Mass.

Joseph Ratcliffe has resigned his position as overseer of spooling, warping and slashing at the Hargraves No. 1 Mill, Fall River, Mass. He has accepted a similar position with the Barnard Manufacturing Co., same city.

James Firth has accepted the position as second hand in the card room at the Auburn Woolen Co., Peterboro, Ont., Canada.

The annual meeting of the Eastern Maine Woolen Overseers' Association was held at the Penobscot Exchange, Bangor, Me., August 31. The election of officers and the transaction of other business were the features of the meeting. George McRea, North Vassalboro, Me., was elected president; Gordon Wayness, Pittsfield, Me., first vice-president; James Lynch, Sangerville, Me., second vice-president; A. T. Spaulding, Dover, Me., secretary, and Fred Miller, Guilford, Me., treasurer. The report of the treasurer, L. C. Sawyer, Dover, Me., was read by the secretary and accepted by the Association. It was decided to hold the next annual meeting at Newport, Me.

Frank B. Carver has been appointed agent of the Holden, Leonard Co., Bennington, Vt. Mr. Carver has been superintendent of this company for a number of years.

F. E. Battles has been appointed superintendent of the Holden, Leonard Co., Bennington, Vt. He formerly held the position of assistant superintendent at this mill.

George D. Lewis has been appointed assistant superintendent at the Holden, Leonard Co., Bennington, Vt. He was formerly employed at the North Adams Manufacturing Co., North Adams, Mass.

Leonard Hollingsworth has been appointed superintendent of the Continental Worsted Co., Providence, R. I. He was formerly superintendent of the Plainfield Woolen Co., Central Village, Conn.

Archibald W. Couper has been appointed superintendent of the Lancaster Mills, Clinton, Mass.

Clarence L. Jackson has accepted the position as overseer of finishing at the Brickner Woolen Mills Co., Sheboygan Falls, Wis. He comes from Reedsburg, Wis.

Francis P. Gallagher, overseer of finishing at the Continental Worsted Co., Providence, R. I., has severed his connection with that company.

J. T. Simpson has accepted the position of designer at the Lymansville Co., Providence, R. I., succeeding Henry F. Ames.

George M. Smith has accepted the position in charge of the carding and spinning at the National Knitting Co., Milwaukee, Wis. He comes from Yantic, Conn.

Benjamin W. Washburn, overseer of dyeing at the Ray Mill, American Woolen Co., Franklin, Mass., has severed his connection with that company to accept a similar position with the City Mills, American Felt Co., City Mills, Mass.

Edmund F. Darling has accepted the position as overseer of dyeing at the Ray Mill, American Woolen Co., Franklin, Mass. He was formerly second hand at the Manton Mill, Manton, R. I.

Donald J. Supple has accepted the position of second hand in the dye house at the Ray Mill, American Woolen Co., Franklin, Mass. He was formerly employed at the Singleton Worsted Co., of the same town.

Edgar F. King, overseer of dyeing at the Squamlake Woolen Co., Ashland, N. H., has severed his connection with that company.

William O'Brien, overseer of dyeing at the Holden, Leonard & Company's Mill, Bennington, Vt., has severed his connection with that company. Mr. O'Brien has been in their employ for a number of years and was obliged to give up on account of his health.

Charles Palmer has been promoted from the position of second hand to overseer of weaving at the Barnard Manufacturing Co., Fall River, Mass.

George Davidson has accepted the position of overseer of knitting at the Fay Stocking Co., Elyria, O.

G. L. Donaldson has accepted the position of fixer at the Ohio Penitentiary, Columbus, O. He comes from Piqua, O.

Samuel Bernard has accepted the position of second hand of finishing at the Huntington Manufacturing Co., Huntington, Mass.

W. W. Ricks has been appointed manager of the Lillian Knitting Mill No. 2, China Grove, N. C. He comes from Cleveland, Tenn.

W. E. Poag has accepted the position of overseer of carding at the new Eva Jane Cotton Mills, Sylacauga, Ala. He comes from Rock Hill, S. C.

A. L. McCombs, formerly overseer of the cloth room at the Grendel Mill No. 1, Greenwood, S. C., has resigned to accept a similar position at Clinton, S. C.

A. C. Smith has been elected president of the new Lang Cotton Mills, West Point, Ga.

J. C. Tiddy has been appointed night superintendent of the Amazon Mill, Thomasville, N. C. He was formerly overseer of spinning at this mill.

Robert Cooper has accepted the position of overseer of night carding at the Delta Mills, McComb City, Miss., succeeding S. B. Hurst.

W. P. Loftis has accepted the position of overseer of spinning at the Riverside Mills, Anderson, S. C. He comes from Seneca, S. C.

Edward DuBose, of the Waxahachie Mills, Waxahachie, Texas, has succeeded his father in the management of the mills.

W. H. Bolton has accepted the position of overseer of spinning at the Bellwill Mills, Wilmington, N. C. He comes from Lumberton, N. C.

A. T. Cain has accepted the position of overseer of spinning at the Lauerdale Cotton Mills, Meridian, Miss. He was formerly employed at the Delta Cotton Mills, McComb City, Miss.

M. P. Stacks has accepted the position of overseer of carding at the Lynchburg Cotton Mills, Lynchburg, Va. He was formerly employed at the Brogon Mills, Anderson, S. C.

Turner Hall has accepted the position of overseer of weaving at the Minneola Mill, Gibsonville, N. C. He was formerly employed at the Ossipee Mills, Elon College, N. C.

J. D. Mays has accepted the position of overseer of weaving at the Springstein Mill, Chester. S. C.

W. H. Elam has accepted the position of overseer of the cloth room at the Grendel Mill, No. 2, Greenwood, S. C.

D. E. Madden has been transferred from overseer of the cloth room at the Grendel Mill No. 2, Greenwood, S. C., to a similar position at the Grendel Mill No. 1, of the same place.

Joseph Herzfield has been appointed secretary and treasurer of the Lang Cotton Mill, West Point, Ga.

B. A. Robertson has accepted the position of overseer of carding at the Lumberton Cotton Mills, Lumberton, N. C.

W. F. Smith has been appointed general overseer of spinning at the Aragon Mills, Aragon, Ga. He was formerly superintendent of the cotton department at the Atlanta Woolen Mills, Atlanta, Ga.

J. C. McDonald has accepted the position of overseer of carding at the Marlboro Mill No. 3, McColl, S. C.

W. E. Ratcliffe has accepted the position of overseer of carding and spinning at the Pilot Mills, Raleigh, N. C.

Arthur J. Basquil, designer for the American Printing Co., Fall River, Mass., at their New York office, has sailed on the Franconia from Boston to Paris where he will study the art of coloring. He was presented with a solid silver military brush and a purse of gold by his associates in the New York office.

W. W. Thompson, for eighteen years employed at the Sangerville Woolen Co., Sangerville, Me., has resigned his position as overseer of spinning to accept a similar position with the Dumbarton Mill, Dexter, Me.

E. A. Copeland has been appointed president of the Mary Leila Cotton Mill, Greensboro, Ga., succeeding the late W. R. Jackson.

Joseph H. Shinn, for many years instructor in the cotton carding and spinning departments at the Philadelphia Textile School, Philadelphia, Pa., is acting manager of the Notaseme Hosiery Mill, Philadelphia.

J. W. Manley has been appointed superintendent of the Manetta Mills, Lando, S. C.

T. A. Gwaltney, overseer of carding at the Chesnee Mill, Lumberton, N. C., has been appointed superintendent of the Lumberton Cotton Mill, same place, succeeding Frank Brietz.

C. P. Godfrey has been appointed agent of the Norton Mills, manufacturers of silk and cotton ribbons, Lowell, Mass.

Hugh Fraser, overseer of the finishing and dyeing at the Lawrence, Webster Co., Malone, N. Y., has severed his connection with that company.

Walter H. Potter has been appointed superintendent of the Greene & Daniels Manufacturing Co., Pawtucket, R. I. He was formerly employed as overseer of spinning at the Holmes Manufacturing Co., New Bedford, Mass.

Charles H. Park, agent of the Beaver Brook Mills, American Woolen Co., Collinsville, Mass., has been appointed agent of the Kennebec Mill, Fairfield, Me.

John H. Williams, agent of the Kennebec Mill, American Woolen Co., Fairfield, Me., has severed his connection with that company.

Fred A. Whitmore, formerly superintendent of the Gilbert loom department of the Crompton & Knowles Loom Works and connected with the Philadelphia plant, has been engaged as general superintendent for McCleary, Wallin & Crouse Carpet Manufacturing Co., Amsterdam, N. Y.

Edward Barker, treasurer of the Barnaby Manufacturing Co., Fall River, Mass., and James T. Cummings, president of this company, have resigned. George T. Almy, head bookkeeper, has been elected treasurer and William H. Pierce has been elected president.

P. J. Carey, overseer of finishing at the North Adams Manufacturing Co., North Adams, Mass., has severed his connection with that company.

Percy Ellis has accepted the position of overseer of carding at the Pontiac Manufacturing Co., Pontiac, R. I. He was formerly second hand in the carding department at the Globe Mill, Woonsocket, R. I.

John Hacking, superintendent of the weaving department at the Jenckes Spinning Co., Pawtucket, R. I., has resigend. He is succeeded by Edward Schuster, who was boss weaver at this mill.

Alfred Brabant has accepted the position as second hand in the spinning department at the Shetucket Co., Norwich, Conn. He was formerly employed at the Ashland Mill, Jewett City, Conn.

Charles Cockroft has been appointed superintendent of the worsted yarn department at the Ashtabula Worsted Mills Co., Ashtabula, O. He was formerly employed in a similar position at the Globe Woolen Co., Utica, N. Y.

Allison Shuttleworth has accepted the position of overseer of spinning at the Champlain Silk Mills, Whitehall, N. Y.

Fred Jackson has accepted the position of overseer of dyeing at the Williams Glove & Gauntlet Co., Grand Rapids, Mich. He was formerly employed at the Murphy Bros. Mill, Philadelphia, Pa.

Thomas J. Connelly has accepted the position of overseer of finishing at the North Adams Manufacturing Co., North Adams, Mass. He was formerly employed at the Emerald Mills, Philadelphia, Pa.

George E. Howarth has accepted the position of overseer of combing at the Cleveland Worsted Mills Co., Cleveland, O. He was formerly employed at the Ashtabula Worsted Mills Co., Ashtabula, O.

Edward Richardson has accepted the position of overseer of carding at the National Crash Manufacturing Co., Millbury, Mass. He comes from East Hampton, Mass.

Fred R. Green has been appointed treasurer and general manager of the Atlas Knitting Co., Amsterdam, N. Y., succeeding W. C. Schaufler.

Charles E. Wilber, for several years master mechanic at the Natick Mills, B. B. & R. Knight, Natick, R. I., has resigned to accept the position of mechanical superintendent at the Lancaster Mill, Clinton, Mass.

Paul Z. Curtis has accepted the position of master mechanic at the Natick Mill, B. B. & R. Knight, Natick, R. I. He was formerly employed at the Clinton Mill, Woonsocket, R. I.

A. G. Hosmer, for the past seven years mechanical superintendent at the Lancaster Mill, Clinton, Mass., has tendered his resignaton.

Thomas F. Parker, president of the Parker Cotton Mill, Greenville, S. C., has tendered his resignation on account of ill health.

W. B. Cash has accepted the position of overseer of weaving at the Limestone Mill, Gaffney, S. C.

B. P. Moore has been promoted second hand to succeed T. A. Hightower as overseer of weaving at the Hamrick Mill, Gaffney, S. C.

B. P. Greene has been appointed superintendent of the Hutcheson Manufacturing Co., Banning, Ga. He was formerly employed at the Fulton Bag & Cotton Mills, Atlanta, Ga., as overseer of spinning.

R. L. Jones has accepted the position of overseer of carding at the Holt-Granite Mills, Haw River, N. C. He was formerly employed at the Lakeside Mills, Burlington, N. C.

George F. Brietz has been appointed superintendent of the Kinston Cotton Mills, Kinston, N. C. He formerly held a similar position with the Dresden Mills, Lumberton, N. C.

C. S. Cozart has accepted the position of overseer of spinning and winding at the New Century Cotton Mills, South Boston, Va. He was formerly employed at the Longhurst Mills, Roxboro, N. C.

P. A. Gwaltney has been appointed superintendent of the Dresden Mills, Lumberton, N. C. He comes from Chesnee, S. C.

A. G. Pittman has been appointed superintendent of the Hamer Cotton Mill, Hamer, S. C. He comes from Fayetteville, N. C.

J. F. Clark has accepted the position of overseer of spinning at the Fulton Bag & Cotton Mills, Atlanta, Ga.

James White has accepted the position of overseer of carding at the Brogon Mills, Anderson, S. C.

S. L. McCracken has accepted the position of overseer of spinning at the Lynchburg Cotton Mill, Lynchburg, Va. He was formerly employed at the Toxaway Mill, Anderson, S. C.

W. S. Johnson has accepted the position of overseer of carding at the Athens Manufacturing Co., Athens, Ga. He comes from Elberton, Ga.

Henry Schoenfield has accepted the position of overseer of carding at the C. J. Amidon & Son's Mill, Wilton, N. H. He comes from Ludlow, Vt.

Timothy Moore has accepted the position of overseer of carding and spinning at the Contoocook Mills, Hillsboro, N. H., succeeding A. L. Hilton.

John Beattie, overseer of dyeing at the Bellingham Woolen Co., North Bellingham, Mass., has resigned.

E. Allen Crowell has accepted the position of overseer of dyeing at the Bellingham Woolen Co., North Bellingham, Mass. He was formerly employed at the Faulkner & Colony Manufacturing Co., Keene, N. H., as second hand.

Edmond J. Doucette, overseer of spinning, twisting and spooling at the Wottoquottoc Worsted Co., Hudson, Mass., has resigned. On leaving he was presented with a traveling bag by the employes under him.

Frank Edgerton has been appointed overseer of weaving at the Central Worsted Co., Central Village, Conn., succeeding Walter L. Caswell.

E. Thornton has accepted the position of overseer of dyeing at the Holden, Leonard Co., Bennington, Vt. He was formerly employed at the Berkshire Wool & Worsted Co., Pittsfield, Mass.

W. E. LaGanke has been appointed general manager of the Cleveland Dyeing & Bleaching Co., Cleveland, O., to succeed W. A. Renicke.

W. H. White, for many years superintendent of the Enterprise Silk Co., Paterson, N. J., is reported as having taken charge of the Oswegatchie Manufacturing Co., mills at Buffalo and Ogdensburg, N. Y. The three mills are all controlled by the same New York parties.

R. L. Quinley has accepted the position of overseer of carding at the Harris, Emery Co., Dustin Island Woolen Mill, Penacook, N. H. He was formerly employed at the Frederick Faulkner Mill, Stafford Springs, Conn.

DEATHS.

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J. Wesley Johnson, 54 years old, a manufacturer at Dallas, Texas, died at his home in that city recently. Until five years ago he was a manufacturer of carpet yarns and railway waste in Philadelphia, Pa. His mill was situated at Allegheny Ave. and Emerald St., and later he was president of the J. Wesley Johnson & Colton Carpet Yarn Spinning Co., Howard and Berks Sts., Philadelphia. Mr. Johnson is survived by his wife and five children.

Arthur Alpheus Smith of Stamford, Conn., one of the best known residents of that section, died at his home on August 26. He was born in Stamford, October 31, 1838. For a number of years afterwards he was connected with the Arnold Print Works of North Adams, Mass., and was associated with Harvey and John F. Arnold, who operated these works.

Frank J. Clemence, for a number of years master mechanic at the Peace Dale Manufacturing Co., Peace Dale, R. I., was run over by a train on the Narragansett Pier division of the Rhode Island Co., while on a business trip to Wakefield, R. I. He was hurried to the hospital where one of his legs was amputated, but he died from a shock following the operation.

Bernard Brondell, a silk manufacturer of Paterson, N. J., who operated about sixty broad silk looms, died at his home in that city at the age of 45 years. A number of years ago he and his three brothers engaged in business under the firm name of Brondell Bros. The partnership was dissolved a year later when Bernard Brondell continued the business and prospered for a number of years. He is survived by a wife.

William Wood, for a number of years overseer of the wool sorting department at the Pacific Mill, Lawrence, Mass., died September 5 at his home in that city. He was born in Yorkshire, Eng., fifty-five years ago and is survived by a wife and two sons.

Nathan Daniels died at his home in Bedford, Mass. He was born at Waltham, Mass., Aug. 28, 1833, and at one time was part owner of the Highland Woolen Mill, at Huntington, Mass. He was manager of this company for a number of years. A wife and one son survive him.

Arthur A. Smith, for a number of years part owner of the Arnold Print Works, North Adams, Mass., died September 3 at the North Adams Hospital. He was born in Stamford, Conn., Oct. 31, 1838. Mr. Smith was unmarried and is survived by one brother.

John Lilley, for a number of years foreman of the carding department at the New England Knitting Co., Winsted, Conn., died at the home of his daughter in that city. He was born in 1844, and was a veteran of the Civil War and a member of Post Wilde No. 25, G. A. R., of Chester, Conn. A wife and five children survive him.

Robert T. Lees, president of the Lees Manufacturing Co., Westport, Conn., and one of the most prominent business men of that city, died suddenly September 19 at his home in Westport. He was 58 years of age and is survived by his mother, a sister, his wife and two children.

Frank E. Busiel, a prominent hosiery manufacturer in Laconia, N. H., died at his home in that city on September 15. He was born in Laconia, Oct. 31, 1851, and had always lived there. He was a director of the Mayo Machine Co., and the Laconia Needle Co. He is survived by a widow, two daughters and a brother.

Thomas McGuirk, a retired superintendent, who was for a number of years with the Putnam Woolen Co., Putnam, Conn., as their superintendent, died at Providence, R. I., at the age of 72 years. Mr. McGuirk is survived by his wife, three sons and two daughters. Burial will be at Norwich, Conn.

Peter J. King, overseer of carding at the Otis Co., Ware, Mass., died at his home September 20 of a complication of diseases, at the age of 54 years. He is survived by his widow, three sons and one adopted son.

Emile S. Duflot, a member of the firm of Mills, Duflot & Co., silk importers, 357 Fourth Ave., New York City, died September 19 of Bright's disease, at his home in Mt. Vernon, N. Y. He was 37 years of age, and is survived by his wife and one daughter.

George W. Holt died at Putnam, Conn., September 26. He was born in Slatersville, R. I., July 21, 1840. For more than twenty-one years Mr. Holt was trustee of the Putnam Saving's Bank and president of that institution for a number of years. Mr. Holt attended the public schools at Slatersville, R. I., then entered the Phillips Academy of Andover and from there went to Brown University where he took a course of two years. He was made assistant superintendent of the Forestdale Mill, Forestdale, R. I., soon after leaving school where he remained for ten years. His next position he accepted in 1871 as superintendent of the Monohansett Manufacturing Co., Putnam, Conn. In 1882 he was admitted as partner in this mill, and later became agent. In 1889 he represented the town of Putnam in the legislature and was one of the incorporators of the Day Kimball Hospital. He is survived by a widow and one daughter.

Zachariah D. Hall, superintendent of the Berkshire Cotton Manufacturing Co., Adams, Mass., died at his home in that city at the age of 72 years after an attack of heart failure. Mr. Hall came to Adams in 1890 taking the position of superintendent of the Berkshire Mills. In 1896 he resigned to accept a position with B. B. & R. Knight's Cotton Mill, Providence, R. I., but later returned to the Berkshire Co., after spending one year in Providence.

Herman Simon, proprietor of the silk manufacturing business, known as R. & H. Simon, 4th Ave. and 20th St., New York City, with plant at Union Hill, N. J., died at his home in Easton, Pa. He was born at Frankford-on-the-Main, Germany, April 25, 1850.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year. Communications for this department are invited. There is no charge made for printing notices of new mills, enlargements, improvements, etc.

COTTON.

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New Mills.

*Georgia, Chickamauga. If the progress being made at present is continued, the new cotton mill being built by the Crystal Springs Bleachery Company will be equipped and ready for operation early in January, 1914. This mill is designed to weave bag goods and will have 20,160 ring spindles and 700 looms. A decision has finally been reached to use electric power to drive the machinery. D. A. Jewell is president, treasurer and buyer, A. S. Bowen is vice-president and secretary, and A. E. Yates is superintendent.

*North Carolina, Charlotte. Manufacturing will be started by the Thrift Mfg. Company in December with 22,000 ring spindles and 580 looms on converters goods. The product will be sold to Wilson & Bradbury, New York. This company took over the mill which the Thayer Mfg. Company started to build and, making some change in the plans, completed the construction work and is now installing machinery. The plant will be operated by electric power and will give employment to 300 hands.

*South Carolina, Kershaw. Most of the equipment for the new Kershaw Cotton Mill is in the building, but with the exception of the engine and boiler none of it has been set up as yet. S. G. Dover, formerly superintendent of a Mississippi cotton mill, has been engaged as superintendent and will supervise the getting of the plant in readiness for manufacturing. Le Roy Springs is the president of this company and J. M. Carson is treasurer.

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Enlargements and Improvements.

Georgia, Atlanta. Four new spinning frames and one warper are being added to the equipment of the Martel Mfg. Company.

Georgia, Lafayette. Two boilers in the Union Cotton Mills are being overhauled and some of the machinery is idle while this work is in progress. The plant will be running in full in about two weeks.

Georgia, Sargent. Additional equipment has been ordered by the Wahoo Mfg. Company, including three cards, one drawing frame, spinning frames, and one spooler.

*Georgia, Toccoa. The new machinery purchased by the Capps Cotton Mills, E. P. Simpson, proprietor, is additional equipment and does not replace any of the machinery now operated. Two thousand spindles will be added.

*Massachusetts, Adams. Besides adding ten new speeders to replace old equipment the Adams Bros. Mfg. Company are adding six winders and building a new cotton storehouse.

*Massachusetts, Adams. Ground has been broken for the new additions to be built for the Renfrew Mfg. Company, recently detailed.

Massachusetts, Easthampton. The Glendale Elastic Fabrics Co. has arranged for electric drive and will install some 88 motors, ranging from one to 25 h. p., with accessories, all of which equipment has been ordered from the General Electric Co.

*New Hampshire, Exeter. The Exeter Mfg. Company will shut down for two weeks to facilitate the installation of new equipment. It has been noted previously that new spinning frames are to be installed to replace old machinery and that when this improvement is completed they will have 12,890 ring spindles.

Massachusetts, Taunton. A new 700 h. p. steam engine and over 100 ring spinning frames are to be installed in the Nemasket Mill of the New England Cotton Yarn Co.

*Massachusetts, Ware. Extensive alterations have been made in the power equipment of the Otis Company during the period in which the mills were closed for the annual vacation for operatives. It was noted in an earlier report that 36 motors ranging from 10 to 75 h. p. would be installed.

New York, Utica. A new cotton opening department is to be built this fall by the Utica Steam & Mohawk Valley Cotton Mills at a cost of about $30,000. It will be two stories high, 154 by 63 feet, and will adjoin the State Street mills. On its completion the opening and picking machinery will be moved into the new building and some additional opening machinery will be installed.

North Carolina, Burlington. New roving machinery is being installed in the Ossipee Cotton Mills of James N. Williamson & Sons Company, replacing old machinery.

North Carolina, Concord. The work of repairing and rebuilding the Roberta Mill, which was damaged by fire several years ago and has since lain idle, is going forward. P. M. Keller, at present superintendent of the Prendergast (Tenn.) Cotton Mills, and John C. Rankin are the men interested and they will organize a company to take over the property about the middle of October. They expect to begin manufacturing about the middle of November. The plant will have 2,000 ring spindles and will manufacture 14s to 26s hosiery and hard yarns. Mr. Keller is manager and buyer and will move to Concord October 1.

North Carolina, Concord. A 100,000-gallon stand pipe is to be erected for the Brander Cotton Mills Corp. and the mill is to be equipped with a sprinkler system. Contracts have been awarded.

North Carolina, Greensboro. Extensive enlargements, which will more than double the manufacturing space, are to be made by the Revolution Cotton Mills at a cost of $1,000,000 to $1,500,000, and will be completed in the fall of 1914. Plans are now in preparation. Colored and bleached flannels are manufactured on present equipment of 31,000 spindles and 868 looms. E. Sternberger is president, H. Sternberger, secretary, treasurer and buyer, and George P. Stone is superintendent. The product is sold by the Cone Export & Com. Co., New York

North Carolina, Haw River. It is probable the Holt-Granite Mfg. Co. will install new cards and roving frames in order to balance the preparatory operations with the spinning room.

North Carolina, Kannapolis. An increase has been made in the slashing department of the Cannon Mfg. Company to correspond with the increase in the weave room. Two new slashers have been installed.

*North Carolina, Lumberton. The work of changing over the Lumberton Cotton Mills to electric drive has been completed.

North Carolina, Newton. The installation of some new machinery equipment in the Clyde Cotton Mills has just been completed. Cotton yarns in warps and skeins are manufactured.

North Carolina, Salisbury. A 2-story brick addition is to be built to the plant of the Salisbury Cotton Mills, manufacturers of colored cotton goods.

North Carolina, Selma. An increase is to be made at the Ethel Cotton Mills, which will include 3,000 ring spindles and additional roving machinery. Power transmission machinery for the increase has not been purchased.

Pennsylvania, Philadelphia. Report has it that William Clark, Inc., manufacturers of table damasks and specialties on Cedar above Margaret St., Frankford, on 140 broad looms, are changing over a portion of their equipment from jacquards to head motion looms for the purpose of making a line of dress goods. They have also installed a new folding and measuring machine.

Pennsylvania, Philadelphia. The M. I. Davidson Company, manufacturers of hair cloths on 80 looms, have removed their plant from 106 West Norris St. to Shackamaxon and Wildey Sts., where larger quarters have been secured.

Rhode Island, Central Falls. An addition to the storehouse of the Waypoyset Mfg. Company will be constructed by the Frank G. Rowley Construction Co. The extension will be 140 by 80 feet, 1 story high.

Rhode Island, Georgiaville. To give more manufacturing space the roof of the Bernon Mill of the Manville Company is being raised and made flat. This change will allow 6,000 additional spindles to be installed, which will give equipment of 35,000 ring spindles. Earlier in the year nine spinning frames were added to the yarn department.

*Rhode Island, Pawtucket. The addition to the plant of the Dexter Yarn Company, started several months ago, is nearing completion. This will permit of an increase of practically all departments. Details have been given previously.

Rhode Island, Woonsocket. Changes and improvements are to be made in the power department of the Clinton Mfg. Co., one of the B. B. & R. Knight Mills, including the erection of an addition to the boiler house, a new economizer building and a new engine room, all of brick construction. The foundations are being laid for three new boilers, a new condenser and a new engine. The main office is at 3 Washington Row, Providence.

South Carolina, Clinton. Six new spinning frames have been purchased by the Lydia Cotton Mills, making the total equipment 22,544 spindles and 500 looms.

South Carolina, Gaffney. An extension, 68 feet in length, will be built on the plant of the Irene Mills at a cost of about $10,000. Considerable new equipment is to be installed, including 1,024 spindles, 14 wide looms and some preparatory machinery. The total estimated cost of the improvement is $25,000. They hope to have the new machinery in operation by November 1. This concern manufactures table damask, napkins and jacquard towels on 3 500 ring spindles and 75 looms.

South Carolina, Greenwood. Increases are to be made in the equipment of the Panola Cotton Mills and it is reported that 5,000 spindles will be added. Ten thousand spindles and 300 looms are operated on sheetings.

*Texas, Dallas. Improvements in the card room of the Dallas Cotton Mills comprise the installation of fourteen new cards to take the place of old style cards which will be taken out.

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Mills Starting Up.

Alabama, Huntsville. The Abingdon Mills have resumed manufacturing after an idleness of three weeks during which a new boiler was installed and considerable repair work done throughout the plant.

*North Carolina, Monroe. A new corporation has been formed under the name of the Jackson Mills Company with capital stock of $125,000 by W. C. Heath, R. A. Morrow, and J. R. English. This is a reorganization of the Monroe Cotton Mills and the mill will shortly be started up on a new line of cotton blankets. An addition is under construction which will be used as a napper room and other improvements about the plant are being made including the changing over of some of the looms to give a wider reed space.

*Tennessee, Trenton. R. A. Love, who heads the new company which has taken over the Trenton Cotton Mills, confirms the report that the plant will be started up in October. Some repairs and changes are being made and a small amount of new machinery is being installed. The mill has 7,400 ring spinning spindles and 2,900 twisting spindles for making 2/20s skein yarns. Mr. Love

is president and treasurer of the Gastonia Mfg. Company, of Gastonia, N. C.

WOOLEN.

Enlargements and Improvements.

*Massachusetts, Caryville. Good progress is being made on the additions to the plant of the Taft Woolen Company, which are being made by the Eastern Construction Company of Woonsocket, R I.

*Massachusetts, Clinton. The foundation for the new 3-story brick mill for the Bigelow Carpet Company, which is to take the place of the old wool house, has been laid and masons have started on the brick work. Much of the scouring and drying machinery in the old wool house will be renewed.

Massachusetts, Cordaville. A new cement dam is being built for the Cordaville Woolen Company to replace the old dam.

*Massachusetts, Medway. A part of the old mill occupied by the Fabyan Woolen Company is being torn down to make way for the new 3-story brick mill. Fourteen looms are to be added to the weaving department.

Massachusetts, Uxbridge. The Stanley Woolen Company is building a chimney to take the place of the iron stack.

New Hampshire, Franklin. An addition is to be built to the Franklin Mills of M. T. Stevens & Sons Company in the form of another story on No. 2 mill, which is 122 by 44 feet. Sargent Bros. will do the brick work and I. M. Hanson will have charge of the wood work. The new space will be used for dry finishing and will relieve cramped conditions at present prevailing in the finishing department.

New Hampshire, Guild. A new weave shed has been built for Fairbanks & Dorr, proprietors of the Granite State Mills, 33 by 110 feet, and 24 looms equipped with individual motors installed. The enlargement will increase the capacity of the mill about 20 per cent.

New Hampshire, Newport. The Brampton Woolen Company has resumed manufacturing after a shut down of one week for repairs which included the laying of a new floor in the finishing room and repairs in the power department.

New Hampshire, North Salem. A steam boiler and engine are being put in the old Atlas Woolen Mills now operated as a shoddy mill by a concern known as the New Hampshire Shoddy Co.

New Jersey, Camden. For the purpose of enlarging their plant at 217 Atlantic Ave., Eavenson & Levering, commission combers, scourers and carbonizers of wool, have had plans prepared for a new carbonizing building to be of slow-burning construction, 80 by 192 feet, of brick. Builders are now estimating on the operation, the idea being to start the work at once.

New York, Dolgeville. The American Felt Company has installed some fulling machinery equipment of German manufacture.

Pennsylvania, Philadelphia. The Westmoreland Manufacturing Co., Thomas Whitehead, proprietor, is removing its equipment of 16 broad looms from 2630 Mascher St. to larger quarters in the Davenport Mills at Mascher St., below York, where the fourth floor of the building has been leased.

*Pennsylvania, Philadelphia. Twenty new broad looms have been purchased by the Saxonia Dress Goods Mills, now located at Howard and Palmer Sts. These looms will be installed in their new mills at Allegheny Ave. and C St., which is now almost completed and ready for occupancy.

*Pennsylvania, Philadelphia. The Delaine Mills, Inc., manufacturers of worsted fabrics on 64 broad looms, are installing 26 new broad looms and having some of their other looms enlarged for making 72-inch goods. They are also installing a finishing equipment which was recently reported by us and a portion of which is already in operation.

Pennsylvania, Philadelphia. At the public sale of the equipment of the Bensdale Mfg. Co., Jasper and Orleans Sts., Messrs. Armshire & Wheeler, textile machinery dealers of this city, purchased the looms and auxiliary machinery which they have sold to the estate of Daniel Lees, manufacturers of upholstery fabrics on 48 looms.

Pennsylvania, Philadelphia. The Penn Novelty Works, operated on rugs and carpets with 10 looms by Turner & Higgins at Howard & Palmer Sts., are removing their plant to Beaver Dam, Wis., where they have taken over a mill. They are installing 1 set of 60-inch cards and other equipment for spinning their own yarns, as well as increasing their weaving equipment.

*Rhode Island, Pawtucket. Preparations are being made by D. Goff & Sons to occupy the large new dyehouse erected during the summer.

*Rhode Island, Woonsocket. While the Guerin Spinning Company will not increase their capacity greatly immediately on the completion of the addition now under construction, they expect to have a more efficient organization when the enlargement is completed. An important feature of the change is arrangements for the cards to be located on the ground instead of on a wooden floor. The exact size of the addition is 72 by 156 feet, one and two stories high.

Rhode Island, Woonsocket. It is reported that more looms are to be installed by the Lippitt Woolen Co., Inc. The plant will shortly begin running nights.

*Wisconsin, Baraboo. As noted in a previous report, the new concrete dam for the Island Woolen Company is completed. They will complete the entire hydraulic installation by constructing concrete head gates and flume and this work will be finished about October 15.

Mills Starting Up.

*Wisconsin, Onalaska. D. C. Stickler expects to start up the old woolen mill before the end of the month. Woolen yarns will be manufactured and sold direct to knitters. The plant contains two sets of cards and 560 mule spindles. Until recently Mr. Stickler was president of the Onalaska Woolen Mfg. Company at La Crosse.

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Mills Shutting Down.

New York, Utica. Rumors that the Globe Woolen Company would close have been confirmed by a statement from President J. F. Maynard in which he states that the plant will shortly be closed indefinitely. Mr. Maynard says that for months the market has been unsettled and unsatisfactory and the management of the Globe Company has decided unanimously to fill the orders on hand and then wait a little time for the situation to clear. The plant will start operations as soon as market conditions become settled.

Pennsylvania, Stroudsburg. Thomas Kitson & Sons, manufacturers of cassimeres, cloakings, suitings, etc., are running out stock preparatory to shutting down, owing to the inability to secure sufficient labor. Orders on hand are being turned over to other mills and as soon as the raw material is worked up all the machinery will be stopped. As to whether the company will go out of business Thomas J. Kitson reports that this will depend largely on whether labor conditions in Stroudsburg improve. There is a possibility that they will move the plant to some other locality.

KNIT.

New Mills.

*Canada, Ontario, Listowell. A charter has been secured by the Perfect Knit Mills, Ltd., a new concern which will establish a sweater manufacturing plant here. Details will be known in about two weeks. Max Becker, formerly superintendent of Frank W. Robinson, Ltd., Toronto, heads the new concern, and the machinery formerly operated by the Keystone Knitting Company at Georgetown, Ont., is to be moved to Listowell and installed in the new plant with some new machinery. Manufacturing will be started about the middle of October.

Canada, Quebec, Montreal. A new sweater knitting plant is being established at 18A Pine Ave., West, under the name of the Regent Knitting Mills, Ltd. Eighteen knitting machines and ten sewing machines are to be operated on men's and women's goods, using 2/18s worsted and No. 8 cotton yarns. The company has authorized capital stock of $100,000 preferred, and $100,000 common. C. G. de Tonnancour is president; J. F. Lemieux, treasurer, and L. Marcoux, superintendent and buyer.

Illinois, Chicago. A knit underwear plant is being established at 1248 Marianna St. by Marshall Field & Company and will begin manufacturing about October 1 giving employment to 100 hands. The product will be men's and boys' union suits made from 1/9s to 1/60s cotton, 1/40s to 1/70s worsted, and also from two-ply yarns. The equipment will be 30 knitting machines and 75 sewing machines. George U. Clark will be superintendent. F. L. Drane, department manager of the wholesale store of Marshall Field & Company, attends to the buying.

*Illinois, Chicago. Work has been started on the new plant for the Vassar Swiss Underwear Company, which will cover an entire block, as noted previously. It will be 4 stories high and will contain about 6 acres of floor space and represent an investment of $750,000. The building will be fireproof, of reinforced concrete construction, equipped with sprinkler system, and will have a complete high pressure steam boiler plant with direct connected dynamos furnishing electricity for power and light. In addition to the main building there will be laboratories and coal storage bins, all of concrete construction. Every convenience is to be provided for the comfort of employes including steel lockers, drinking fountains, lunch rooms, rest rooms, reading rooms, etc. There will be a private switch track from the Northwestern Railway and outgoing and incoming freight will be loaded directly from cars. It is expected the new plant can be put into operation shortly after the first of the year. The product of the Vassar Swiss Underwear Company is confined to men's union suits of the highest grade and when the new plant is in operation from 800 to 1,000 people will be employed. The Vassar Swiss Underwear Company was organized about 10 or 12 years ago and was originally located in Chicago. Later the business was removed to Rochelle. The general offices are at 3617 South Ashland Ave., Chicago. The New York office is at 381 Fourth Ave.

Minnesota, Litchfield. A plant to manufacture sweaters, hosiery and underwear has been established here by a concern known as the Litchfield Knitting Mill, which has capital stock of $10,000. N. C. Neilson is one of the men interested.

Minnesota, Minneapolis. Fred Palmdahl has installed several knitting machines at 1705 E. Lake St. on which he is manufacturing sweaters. He is operating under the name of the Lake Street Knitting Works.

Pennsylvania, Adamstown. Harry K. Stork & Co. are reported as having started up a plant here in which they are making a line of hosiery which they are selling to other manufacturers in the grey.

*Pennsylvania, Carlisle. An agreement has finally been signed between the Interwoven Mills, Inc., of New Brunswick, N. J. and Martinsburg, W. Va., and the Carlisle League regarding the large new mill to be established here. Arrangements will be perfected at once for the building of a mill to employ at the start about 400 hands.

*Pennsylvania, Mifflintown. Max Nestler, 118 N. Summit St., Harrisburg, and K. O. Nestler are the men who will build a mill on Fourth St. to be equipped for the manufacture of silk hosiery. K. O. Nestler is at present in the South on a bus-

iness trip and details of the new mill will be completed on his return.

Pennsylvania, Philadelphia. Under the name of the American Standard Knitting Mills, Messrs. Brudneck Bros. have started up a plant at 1545 South 7th St. on sweater coats. The present equipment is 3 flat knitters and 4 sewing machines.

*Pennsylvania, Philadelphia. Haber, Neuman & Co., recently reported by us as starting up a plant for the manufacture of sweater coats at 123 and 125 North 5th St., have installed 20 flat knitters and 15 sewing machines. They are running on shakers and full fashioned ribbed goods for men, women and boys, using fine woolen and worsted yarns only. The plant is being operated under the name of the Fairmount Knitting Mills and the production sold direct. A selling agent for New York will be appointed by the company within the next few weeks.

Pennsylvania, Pottsville. The Valley Knitting Mills, with Givler & Ditzel as proprietors, have been started up in the neighborhood of 9th and Mine Sts., where 10 knitters and 18 sewing machines have been installed on which they are manufacturing a line of women's ribbed vests.

Pennsylvania, Reamstown. Report has it that Raymond Becker is about to start up a plant here for the manufacture of seamless hosiery, the production to be sold to other manufacturers in the grey. The plant, it is said, will be located in a building at one time occupied by another knit goods manufacturer.

Pennsylvania, Tower City. H. A. Troutman is arranging for the starting up of a plant for the manufacture of women's ribbed underwear. Equipment has already been ordered and will soon be installed.

Pennsylvania, Tower City. A plant for the manufacture of women's ribbed underwear is to be started up in this town by W. J. Henry. It is reported manufacturing will begin with 5 knitters and 6 sewing machines.

*South Carolina, Union. Particulars of the new knitting mill to be started by J. H. Gault, formerly treasurer and manager of the Excelsior Knitting Mills, cannot be secured at present. The previous report that a site has been selected and that construction work will be started as soon as possible is correct, but details have not been worked out by Mr. Gault and further information cannot be given until later.

*Tennessee, Englewood. The officers of the new Englewood Mfg. Co. are J. W. Chestnut, president, and T. J. Lillard, secretary and treasurer. Mr. Lillard is treasurer and buyer of the Jewel Cotton Mills of Thomasville, N. C., which will probably supply yarn to the new hosiery mill. The Englewood Mfg. Co. will begin manufacturing in a few weeks with 24 footers and 24 ribbers.

*Tennessee, Dayton. C. E. Bearden, of Chattanooga, is working on plans and specifications for the plant to be erected by the new Dayton Hosiery Mills Company, recently incorporated with capital stock of $60,000. Garnett Andrews, of Chattanooga, is the general manager and buyer, as noted recently.

*Tennessee, Morristown. Plans have been completed and building operations will be commenced in about ten days on the new one-story brick hosiery mill which is to be established here as a branch of the Holston Mfg. Co. of Lenoir City. The new mill will be operated under the name of the Holston Mfg. Co. and will have an equipment of 250 knitters and ribbers, driven by electricity, to make misses' fine gauge hosiery, employing 250 hands. The goods will be shipped to Lenoir City to be dyed and finished. The Holston Mfg. Co. is making an investment of about $100,000 for this increase in its facilities. The equipment, which will be new throughout, is now being purchased and manufacturing will be started about Jan. 1.

*Tennessee, Riceville. Work has been started on the erection of a factory building for the new Riceville Knitting Mills, reported incorporated a week ago with capital stock of $25,000. Thirty footers, 30 ribbers and 10 looping machines will be installed on the completion of the mill about November 1 and if the labor can be obtained this equipment will be doubled within the next six months. As suggested in the report of incorporation, this mill will be operated as a branch of the Athens Hosiery Mills of Athens, Tenn., of which R. J. Fisher is proprietor, and the product made at Riceville will be finished at and shipped from the mill at Athens.

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Enlargements and Improvements.

Alabama, Alexander City. The Russell Mfg. Co. will install electric drive equipment, including 4 transformers, 38 motors of from 1 to 50 h. p. and accessories, orders for which have been placed with the General Electric Co.

*Canada, Ontario, Alton. William Algie, proprietor of the Beaver Mills, has not decided as to the kind and number of machines to be installed in the addition now under construction. The enlargement will give 4,000 square feet of additional manufacturing space and is nearly completed. The Beaver Mills make men's flat, ribbed and fleeced underwear and children's ribbed underwear in cotton, wool and worsted, on present equipment of 20 spring needle and 20 latch needle knitting machines, 6 ribbers and 35 sewing machines, dyeing and finishing equipment, etc.

*Canada, Ontario, Toronto. An initial expenditure of $15,000 is being made by the Reliance Knitting Company, Ltd., for the new men's underwear department and this department will be increased as the trade warrants. They are well-known manufacturers of sweaters and fancy knit goods. The new department will be equipped to manufacture two-piece suits and union suits.

*Canada, Quebec, Montreal. The new knitting department equipped by the Dominion Cord & Tassel Co., 505 St. Paul St., consists of 15 knitting machines and 6 sewing machines for making mufflers or motor scarfs.

*Georgia, Rome. The new addition to be built at the Rome Hosiery Mills is to be of brick construction, 64 by 120 feet, 2 stories high. It will be equipped with sprinkler and heating systems and about 100 knitting machines will be added to the plant, which will give a daily output of 2,200 dozens of misses', ladies' and half hose. They will also increase their dye house capacity by adding two dyeing machines and an extractor, and will increase the board room by adding three dry boxes and one press. The Rome Hosiery Mills bought the Cherokee Hosiery Mills Company last October and since buying this plant have added 78 machines which give an output at the Cherokee Hosiery Mills Company of 1,100 dozen per day, which gives a total daily output of 3,300 dozen. They sell strictly to the jobbing dry goods trade. H. R. Berry is secretary and treasurer.

Illinois, Kankakee. A new waste card has been installed in the local plant of the Paramount Knitting Company. Frank Pope is superintendent.

Iowa, Atlantic. Two fully automatic sleevers and two fully automatic body machines for sweater coats have just been installed by the Atlantic Knitting Company.

*Michigan, Grand Rapids. The announcement that the Grand Rapids Underwear Company will build a new 2-story brick mill, 50 by 125 feet, on a site recently purchased, is premature. It has not been fully decided to build at all. They have been figuring on a building of the above dimensions with contractors, but have not decided to go ahead at the present time.

Michigan, Muskegon. The Muskegon Knitting Mills, Louis P. Haight proprietor, have added the manufacture of wool batting to their products. Additional equipment has also been installed in the wool yarn department.

Minnesota, Minneapolis. New fully automatic knitting machinery for manufacturing sweaters has been installed by the Northland Knitting Company.

Minnesota, St. Paul. During the next three months a number of new knitting machines for making cotton back sweater coats will be added to the equipment of the Minnesota Knitting Mills Company, 282 E. 7th St. The company was reorganized in December, 1912, and Ambrose Guiterman of Guiterman Bros. was elected president. Since that time the plant has gradually been increased.

New Jersey, Wharton. An addition is being built to the Main Street mill of the Singleton Silk Mfg. Company. This property is occupied by the Wharton Textile Company, manufacturers of cotton and silk seamless hosiery for men and women, and the enlargement will increase their facilities. M. Munson Searing is president and J. Allen Crews, manager. Mr. Searing and Mr. Crews both attend to the buying.

*New York, Cohoes. When larger quarters are secured by the B. & L. Textile Company, either in Cohoes or in some other locality, they will increase their output by adding a full line of sizes of spring needle knitting machines. The report they have decided to remain in the present quarters is incorrect.

New York, Cohoes. Two large electric motors have been installed by the Hope Knitting Company. The mill was recently shut down owing to a lack of water power.

New York, Cohoes. Preparations are being made by the Fuld & Hatch Knitting Company to build a 6-story brick storehouse. The location selected is near the mill on Oneida and Saratoga Sts.

*New York, New Hartford. Work has been started on on enlargement to the plant of the Olympian Knit Goods Company which will be 154 by 50 feet, four stories high, to increase the production of ladies' light weight ribbed underwear. In addition to this new mill a new boiler and engine house, 35 by 47 feet, will be built. The enlargements will be completed before January 1. D. L. Davies is treasurer and J. C. Rahn is superintendent. Both of these men buy for the concern.

New York, New York City. Plans are being made by Boyd & Company to install from 35 to 50 full fashion knitting machines for making silk hosiery. This concern recently established a plant on Prospect St., above 180th St. for the manufacture of silk underwear fabrics.

*New York, New York City. It is estimated that the loss in the recent fire at the plant of Bonmen & Co., Inc., is from $15,000 to $20,000; fully covered by insurance. The work of repairing is proceeding and there will be little delay in the delivery of orders. Sweater coats and fancy knit goods are manufactured.

SILK.

New Mills.

New Jersey, Garfield. An annex is being started in Garfield by the Paragon Silk Company of Paterson. This branch will have equipment of 71 broad silk looms.

New Jersey, Paterson. A new commission winding and warping concern is equipping a plant in the Eastwood Mill on Railroad Ave. under the name of Simpson & Hall.

*New Jersey, Paterson. The new 3-story addition, 50 by 90 feet, being built by Prescott & Waywell, commission winders and warpers, will be ready for machinery in about six weeks. The present volume of business is too large for the present quarters.

New Jersey, Paterson. Six more looms are being installed by P. A. Collins, a manufacturer of broad silks in the Highland Mill.

*New York, Whitestone. The walls are practically completed on the new silk mill being built by Jacob Sulzbach of College Point and it is expected that by October 1 machinery will be installed. The temporary plant on North 11th Ave., started to instruct operatives, is proving a success and many hands will be ready to start work when the new mill is opened.

New Publications

Any work noticed under this heading can be obtained, postage or express charges free, by sending the price listed to Lord & Nagle Company, 144 Congress St., Boston, Mass.

Patents, Copyrights and Trade-Marks; by W. Henry Elfreth; 260 pages, 5 by 7; The Addison Press, 21 South Twelfth St., Philadelphia, Pa. Price $3.

This book was written with the object of presenting to the manufacturer a concise statement of the federal law, decisions and practice relating to patents for machines, processes, compositions of matter, and designs, as well as trade-marks, prints, labels and copyrights. It brings to the attention of the manufacturer the vast amount of business protection afforded by the federal statutes. The author during the course of his experience as counsel in patent matters, has been brought in contact with a great number of manufacturers and has had it demonstrated that the average manufacturer believes that a patent can be obtained only for a mechanical device, overlooking, as a rule, the field of design patents, covering rugs, necktie and hosiery designs and the designs of textile fabrics generally. Mr. Elfreth's book will give to the manufacturer the answers to many of the questions that are constantly confronting him.

Cotton in Egypt and the Sudan; by Moritz Schanz; 142 pages, 6 by 9 1/2; published by the author, Chemnitz, Germany.

Herr Schanz, who is well known to our readers, has made repeated visits to Egypt and given the question of cotton growing careful study on the spot, having been assisted by many experts. He was a delegate to the International Cotton Conference at Atlanta in 1907 and in Egypt in 1912. The results of his studies of cotton growing in Egypt and the Sudan are given in this volume, which will repay careful study.

BUSINESS LITERATURE

"The Revolvator and What is Said About it"; N. Y. Revolving Portable Elevator Co., Jersey City, N. J.

An attractive 24-page booklet containing extracts from a large number of letters which have recently been received by this company, commenting upon the various uses to which the Revolvator has been put in different industrial plants. All the letters are of recent date and forcibly point out that tiering machines can be used to advantage in practically every kind of manufacturing plant. The book contains a number of illustrations showing the Revolvator in use in plants from which the letters were received, and the book is worth reading by anyone who is interested in cutting down the cost of handling material and increasing the storage capacity of warehouses.

Guide Book to the Industrial Refrigeration Exposition; The Vilter Manufacturing Co., Milwaukee, Wis.

A very interesting 92-page booklet containing much valuable information concerning all the points of interest in all the cities visited in connection with the exposition of the third International Congress of Refrigeration held in the International Amphitheatre, Chicago, Ill., on Sept. 17th to Oct. 1st inclusive. It also illustrates the many makes of ice making and refrigerating machinery built by the Vilter Mfg. Co.

Comparative Tests of Belts With and Without Cling-Surface; The Cling-Surface Co., Buffalo, N. Y.

This is a copy of a report on careful tests by Robert T. Kent, M. E., on the advantages of the treating of belting with preservatives to increase cohesion between belt and pulley surfaces, and to determine the relative pulling power of treated and untreated belts, at different arcs of contact on the pulley, and at varying tensions on the belt.

Industrial Notes

EXPORTS OF KNITTING MACHINERY FROM CHEMNITZ TO UNITED STATES

The United States Consul at Chemnitz recently forwarded an official statement of the exports of hosiery and knitting machinery from the Chemnitz district to the United States for the six months period from January 1st, to June 30th, 1913. He states:

"Since January 1st, 1913, 175 large automatic cotton knitting machines have been shipped from Chemnitz. The number of the smaller power machines and hand machines for the same period was 516, and the number of sewing, linking and looping machines for hosiery also reached 516. The prospective lowering of tariff rates on hosiery imports evidently does not cause any slackening in the steady enlargement of the equipment of American hosiery mills."

In this connection the statement of importations during the same period, made by the Grosser Knitting Machine Co., of New York, is of interest. Of the 175 cotton automatic machines imported, their importations were 28, about 16 per cent. Of the 516 seamers and loopers, their importations were 468 machines, more than 90 per cent. of the Chemnitz exports to the United States. Of the 516 flat knitting machines, including hand and power, they imported 475 besides about 80 machines shipped direct to Canadian mills, which are not shown by the Consul's statistics; this would indicate that 92 per cent. of the Chemnitz district hosiery machinery exports of flat latch needle knitting machines have been handled by the Grosser Knitting Machine Co.

ATHLETICS AS AN AID TO EFFICIENCY

The American Pulley Company's employes recently held their first annual field day on the company's big athletic grounds. The "American" boys showed there, that muscles developed by hard work are as capable of prowess, in the various departments of field sports, as sinews trained by expert professional coaches. The record made by the "Americans" compared more than favorably with those of college athletes and other amateurs. One thing is certain, "American" Steel Split Pulleys have not suffered in quality nor has their number per day diminished since field sports were introduced at the company's Philadelphia plant. Every day during the noon hour the large athletic field owned by the company is used by the employes. The company has an organized baseball team for the summer and soccer and basketball in the winter. Tennis is the favorite of the office corps. Some of the energy and determination acquired on the company's athletic grounds is daily being transformed into "American" pulley efficiency.

FLAX-GROWING ATTEMPTS IN YORKSHIRE

By Consul Benjamin F. Chase, Leeds, Eng.

An attempt is being made by the Development Commissioners of England, through the University of Leeds, to revive the flax-growing industry in Yorkshire. Through the efforts of Prof. Priestley, of the botany department of the university, about 120 acres of land near Selby were sown this year. The university has also arranged to rent an abandoned mill at Selby for three years, to be fitted up for preparing the flax for market.

This central retting depot was procured to insure the farmers that their efforts would be devoted only to growing flax. At one time the district raised great quantities of flax, and as late as 1896 (according to the press) 1,000 acres were grown in that region. The industry passed out here with the development of cotton, and flax spinning has disappeared from Leeds, where it stood first for a long time.

During the sixteenth century a law made it obligatory that for every 60 acres of land tilled one had to be devoted to flax.

Flax is now worth twice as much in the market as it was 10 years ago, and it is thought that the industry is well worth taking up again. The introduction of flax fiber from Russia in recent years was the main cause of the disappearance of its growth in England. Flax pulling for the season started in this region in August.

A COLLECTION OF SAMPLES

A collection of samples of textiles from the Bureau of Foreign and Domestic Commerce was recently exhibited in the Boston Chamber of Commerce, 177 Milk St. It included samples of cotton, linen, silk and woolen goods sold in Argentina, Russia, Turkey, Bulgaria, Roumania, Servia, Egypt, Arabia, Syria, Italy and Canada. The materials are largely of English, German, Austrian, French, Swiss, Spanish and Italian manufacture, though in a number of instances the product of native factories were shown.

IN NEW QUARTERS

A. Hun Berry, manufacturer of ventilating fans, has recently removed to a new and more convenient shop next door to his former location. His present address is 29 West First St., Boston, Mass.

General Berry bought this property in the spring, and during the summer months has entirely remodelled it for his business.

A new concrete floor has been laid on the first floor, giving a firm and solid foundation for the machine tools. The erecting is also done on this floor. All the tools are driven by electric power. A separate heating plant has been installed.

The second floor will be used for pattern making and other carpenter work, as well as for storage of completed fans.

General Berry specializes on textile and tannery work, but the largest proportion of his business is with the textile mills. His list of customers embraces many of the leading concerns, whose repeat orders come to him unfailingly whenever a new fan is desired.

In connection with the sale of fans, it is often necessary to supply advice and professional services in connection with ventilating, drying and steam removing problems, and the purchasers of the Berry wheel get also the benefit of General Berry's long professional experience as a ventilating expert.

This establishment has confined itself exclusively to the manufacture of fans for over twenty-five years, during which time the Berry Fan has acquired a wide reputation as an efficient air moving apparatus.

LABOR TROUBLES IN INDIAN MILLS

According to the Indian mail a serious riot broke out recently among the coolies employed at the Augus Jute Mill, Gouhati, Bhadreswar. There is wide divergence of opinion as to the immediate cause of the rioting. The Mahomedans state that while their co-religionists were engaged in prayer, a jemadar of the mill did something that annoyed them. They thereupon lodged a complaint with the manager, and as he did not instantly dismiss the jemadar the Mahomedans left work. While they were going from the mill a fierce fight broke out between the Hindus and the Mahomedans, sticks and stones being freely used. The Mahomedans got the worst of the encounter, and on the arrival of a strong detachment of police it was found that five men were seriously injured and had to be removed to the Serampore Hospital.

The police report that the cause of the outbreak was rather different from that to which it was attributed by the Mahomedans. Evidently a Mahomedan with handcuffs on was seen running near the mill by the jemadar, who pursued and caught the man. The Mahomedan mill hands became excited on seeing one of their men in the hands of the jemadar, and it was this that led to the fight. The manager and his European staff tried to calm the mob, but their presence had no effect, and police assistance had to be sought by steamer.—The Textile Mercury.

THE TEXTILE EXHIBITION

The plans for the fourth exhibition under the auspices of The Textile Exhibitors Association, Inc., are well in hand. At the last meeting of the Association it was decided to secure the entire Mechanics Building in Boston for the next exhibition, thus increasing the floor area by some 70,000 square feet of space over that which was used at the last textile exhibition.

At this early date a large portion of the space on the main floor has been applied for by representative concerns in the textile industry, and in many cases the old exhibitors have applied for their former spaces with large additions.

Arrangements have been made with the New England Association of Commercial Engineers to take over one entire department, to be known as the "Power Section," while another department will be devoted in the main to general exhibits of interest to mill construction. With these added departments the interest should be greatly increased, and the value to the exhibitor should be unquestioned. From present indications it would appear that the balance of the floor space would be quickly apportioned.

During the exhibition the convention of the cotton manufacturers will be held, and invitations have been extended to many of the allied associations to hold their spring meetings during that week in Boston. In addition to these meetings the master mechanics and commercial engineers will hold their conventions, and they will naturally be in touch with the manufacturers who exhibit in the other departments.

At the meeting of the Directors, held very recently, applications from the following well known concerns in the trade were considered and spaces allotted:

Universal Winding Co., Westinghouse Electric & Mfg. Co., Macrodi Fibre Co., Barber Colman Co., Cell Drier Machine Co., Carrier Air Conditioning Co. of America, General Electric Company, The G. M. Parks Company, U. S. Gutta Percha Paint Co., Lord & Nagle Company, Franklin Process Company; Borne, Scrymser Company; Alfred Suter, Cling-Surface Co., H. W. Butterworth & Sons Co.; S. F. Bowser & Co., Inc.; Henry L. Scott & Co., The Stafford Company, Mason Machine Works, Textile Finishing Machinery Co., The Cork Insert Co., Saco-Lowell Shops, Thos. Leyland & Co., Crompton & Knowles Loom Works, Arlington Machine Works, William Sellers & Co., Dodge Mfg. Company, Holyoke Machine Co., Enterprise Rubber Co., Foster Machine Co., Lewis E. Tracy Co., Draper Company, American Warp Drawing Machine Co.; John Hetherington & Sons, Ltd.; Woonsocket Machine & Press Co.; Wm. V. Threlfall; Potter & Johnson Machine Co., Fales & Jenks Machine Co., Easton & Burnham Machine Co., T. C. Entwistle Co., Whitin Machine Works, American Tool & Machine Co., Birch Brothers, F. H. Gowing, John H. Giles Dyeing Machine Co., Hess Bright Mfg. Company, The Philadelphia Dyeing Machinery Co., The C. J. Root Company, Boston Belting Co., Detroit Graphite Co., Textile Manufacturers' Journal, Comptograph Company, S. K. F. Ball Bearing Co., Jones & Hardy, Inc.

Information regarding spaces available and any other particulars regarding the exhibition can be secured from Chester I. Campbell, Secretary, 5 Park Sq., Boston, Mass.

THE PHILADELPHIA WOOL AND TEXTILE ASSOCIATION

The first outing and banquet of this organization was held on September 19 with about 100 members of the Boston Wool Trade Association present as guests. Every effort was exerted to make the affair a success in return for the entertainment of the Philadelphia wool dealers at Boston last year. The sports consisted of golf, tennis, running races, three-legged race, potato race, one mile relay race, a tug of war and baseball. A banquet was given in the evening at the Bellevue-Stratford. Ex.-Gov. Bunn of Idaho was toastmaster, the speakers being J. F. Brown and Arthur E. Gill of Boston, John P. Wood, Congressman J. Hampton Moore, James Cattell and Arthur C. Bigelow.

BIG POWER HOUSES

The great power house at Keokuk, Ia., recently completed by the Mississippi River Power Co., will develop 300,000 h. p. In its construction 650,000 barrels of cement and 7,000 tons of steel were used. The concrete work in the power house is painted with Rice's Granolith, a tough, elastic, permanent finish, which becomes part of the concrete to which it is applied.

Another great piece of work, in which the products of the U. S. Gutta Percha Paint Co., of Providence, have been used, is the new South Boston power station of the Boston Elevated Railway Co., with an ultimate development of 125,000 kilowatts. Its underground transmission lines cover 39 miles. The concrete work in the South Boston power station and in all of the sub stations is painted with Rice's Mill White, giving a glossy, tile-like sanitary finish.

Last week the S. Morgan-Smith Co., 176 Federal St., Boston, closed a contract with the Somersville Mfg. Company, of Somersville, Conn., for an outfit of wicket gate wheels. This work consists of one pair of outward discharge wicket gate wheels in steel case mounted on horizontal shaft and arranged to direct connect to generator. The capacity of these wheels will be 490 h. p. under 28 ft. head, at a speed of 300 revolutions per minute. They are also to furnish Lombard governor and the necessary head gate works consisting of trash rack, supports, head gate hoist and waste gate hoist. This work is to be installed about two miles from the mill buildings and the power will be transmitted electrically.

This company has also been awarded a small contract for a wheel outfit for Mrs. J. B. Mcrill of Boston, who is building a small plant near Scotland, Conn., for the manufacture of corsets.

*Pennsylvania, Maltby. Manufacturing will begin next week in the new silk mill built for A. L. Storms.

PENNSYLVANIA UNDERWEAR MANUFACTURERS MEET

The regular bi-monthly meeting of the Pennsylvania Underwear Manufacturers of the National Association of Hosiery & Underwear Manufacturers held in September was a pleasant occasion. It was held again at the bungalow of the Blue Mountain Fish & Game Association at Hamburg, Pa., this courtesy being once more extended to the manufacturers through S. D. Bausher and A. J. Fink, who are members of this club.

The bungalow is situated over a mile outside of the town, so that many of the visiting members motored direct to the club house; others came by train, and were met at the stations by autos, and were conveyed to the grounds. By one o'clock there were over thirty present, and the keen, bracing mountain air had given them the appetites to appreciate the appetizing repast which was set before them, in which chicken and waffles were the chief attraction. After doing full justice to the well-known generous hospitality of the up-state Pennsylvania, the meeting was called to order in the spacious lobby by Edward Blood, Sr.

Various matters were brought up for discussion, all of which were of interest to the underwear manufacturers. The various members related their experiences, and in more than one case cited instances where they had benefited by hearing their fellow manufacturers state they had adopted certain policies. The problem of the cotton yarn market was fully discussed, and the possible developments of the present situation. The manufacturer was warned against the evils of overselling his product without being fully covered on yarns on account of the uncertain conditions bound to prevail for some time to come. Each manufacturer was advised to study the raw cotton market, so as to be thoroughly familiar with the situation, and the conditions of the crop, and the distribution of the world's consumption of the raw material. By this means they would keep posted as to the possible trend of yarn prices, and could protect their interests better along these lines. Argument was advanced as to the strong necessity of the manufacturers adhering strictly to their prices, and even advancing them where required to meet the advance in yarns. It was stated that they were in most instances selling their goods at prices practically the same as last year, and yet their yarn costs were greatly increased over those of last year. For this reason they were urged to maintain a firm front in holding out for a price commensurate with their manufacturing costs. The business conditions in the New York market were such that price cutting would not bring about any increased orders at present.

Another subject which received considerable attention was the labor situation. The new Pennsylvania Labor Laws go into effect November 1st this year, and manufacturers will find that it will have a marked effect upon the operation of their plant. The situation, therefore, must needs be studied carefully, and steps taken to meet the new conditions to the best possible advantage. The decreased hours must necessarily add to the cost of the product, and therefore the manufacturer cannot afford to overlook it.

However the chief subject under discussion was that of the matter of costs. The Association is fully aware of the fact that many manufacturers are not fully cognizant of the importance of figuring on this subject, so as to cover the smallest possible details. Therefore sample cost sheets were mailed to the various manufacturers, asking them to note these items and to fill in the blank and forward unsigned to the Secretary for the purpose of striking an average which could be utilized to demonstrate the system to the members. Several of these were in the hands of the secretary at the time of the meeting. A blackboard was called into service and Walter W. Moyer proceeded to demonstrate his ability as a lightning calculator and financier. The results he showed were of the most illuminating character, and the analysis of the items entering into the cost of manufacture proved to be most instructive. The result and influence of the figures were so striking that it was decided to submit similar figures drawn up by an expert on the various lines of underwear, to the manufacturers of light weight underwear, this to be done by a personal representative of the association. It was felt that this would be the most effectual method of educating the manufacturers as to the proper way to figure the costs of manufacture so as to secure a proper price for their goods. At the conclusion of the meeting the members present were unanimous in the praise of the value of such discussions, and it was admitted by all that the meeting had been the most interesting and beneficial ever held.

Those present were: Edward Blood, Sr., J. Blood & Bro., Philadelphia; D. D. Coldren, Schuylkill Haven, Pa.; Walter W. Moyer, Ephrata, Pa.; Chas. J. Baker, J. C. Parsons, Parsons & Baker, Phoenixville, Pa.; Dr. J. F. Schultz, C. F. Schultz, Schultz Underwear Co., Reading, Pa.; Alexander Allen, W. A. Allen, Allen Knitting Mills, Philadelphia; Walter Mock, H. A. Rober, Meck & Co., Schuylkill Haven, Pa.; Dr. A. J. Fink, Langhorne Fink, Dr. S. K. Hoffman, Hamburg (Pa.) Knitting Mills and Bleach Works; E. J. Scheerer, F. W. Scheerer Sons Mfg. Co., Pottsville, Pa.; S. D. Bausher, C. W. Yeager, O. A. Lau, George Zook, W. Smith, Gotham Underwear Mills, Hamburg, Pa.; J. A. Scharadin, Orwigsburg (Pa.) Knitting Mills; S. J. Bowman, F. E. Ammerman, Shamokin Underwear Mills, Shamokin, Pa.; John D. Rems, Robt. W. Rems, Macungie (Pa.) Knitting Mills; A. S. Hornberger, Herbert Hornberger, M. C. Killian, A. S. Hornberger & Co., Mohnton, Pa.; C. B. Carter, Secretary National Association Hosiery and Underwear Manufacturers, Philadelphia; W. J. Flesh, Textile World Record; H. E. Wilson, Fibre & Fabric; C. W. Fisher, Textile Manufacturers' Journal.

THE ARABOL MFG. CO.

Many manufacturers who are still using tallow as a softener would be greatly astonished at the superior results obtained with the soluble softening oil, made by The Arabol Mfg. Co., 100 William St., New York. They would be impressed by the smooth finish of the warps, the easy parting of the threads in the lease rods and the clean

and bright appearance of the slash cylinders. They will find the soluble softening oil in the same condition at all seasons, sweet, pliable, uniform, winter and summer. It is neutral and easily handled. With closely woven goods, such as corduroys, velveteens, sateens, umbrella goods, cambrics, etc., it gives especially fine results.

THE STORY OF A TRADE MARK

Tradition has handed down many quaint tales which are supposed to account for discoveries and inventions made ages before the printing press and the Patent Office existed to record the steps by which the gradual development of industry took place. The American Felt Co. has recently adopted for its trade mark the sandaled foot of a monk. It suggests "progress" or "a step forward," but its real significance is only understood upon reading the tradition of "The Twelfth Century Miracle," purporting to tell the origin of felt.

This is the story:

"It came to pass in the pleasant land of France, in the days of Robert the Devil, that a certain monk dwelt in the city of Caen, whose name was St. Feutre. Now this monk for his sins felt called upon to make the pilgrimage to the Shrine of St. Michel-in-peril-of-the-sea, which is on a mount placed in the ocean not far from the good village of Pontorson. So this monk set forth from the Abbey Aux Hommes which had been founded as a religious house by William the Conqueror in expiation for his sins, inasmuch as his marriage to Matilda was displeasing to Heaven. He started upon the morning of a bright day, with staff in hand, his robe girded around him, the cockle shells in his cap, and a new pair of sandals on his feet just turned out by a brother-cobbler of the Abbey.

"Now it was at the season of the year when but few pilgrims are wending their way toward the west coast, so that St. Feutre had the road to himself, and though he set out blithely each morn he was much wearied at night when he arrived at the inn or religious house where he was to sleep, and his feet were sore and worn by token that his sandals were new and his feet uneased to them, and as he walked on he thought to himself that each step taken in his new sandals was a part of the penance that he was doing for many sins, of which he hoped to be relieved when he reached the shrine of holy St. Michel. But at times, as the way waxed long, he felt that his penance was more than he could bear. From time to time on his tedious journey, he passed flocks of sheep being driven by the shepherds to the nearest market towns, and he wondered within his heart whether it would be displeasing to God if he should reach out his hand and pluck a handful of wool from the backs of the passing sheep and put the wool in his sandals for his feet to tread upon, and thus ease the soreness which his feet had taken from the shoes.

"And as he thus communed with himself it came to him that he would ask God to bless the action and vouchsafe a miracle to him that it had not been unfitting and he should thus make his pilgrimage more easy to his feet.

"And so he plucked from the backs of the passing flocks of sheep, not one, but several handfuls of the wool, which he placed upon the soles of his shoes to his great comfort, and then he proceeded upon his journey, and lo! at the end of the fifteenth day he arrived at the Island of Mount St. Michel, and as he stood before the Shrine of St. Aubert the miracle was vouchsafed to him, for he pulled off his sandals and in the bottom of each was a new cloth, unknown before, firm of texture, soft to the touch and strong, made from the wool of the sheep, tramped down by the daily footsteps of the pilgrim." The miracle had been performed, and so this mark has been made and established to signify the products of the American Felt Company, in memory of St. Feutre and his miracle.

A SALE OF MILL PROPERTY

J. E. Conant & Co., auctioneers, of Lowell, Mass., have recently issued a catalogue announcing the sale of the ten manufacturing plants of the Ashley & Bailey Co. at Paterson, N. J.; Hawthorne, N. J.; York, Pa.; Columbia, Pa.; Marietta, Pa.; Coatesville, Pa.; Fayetteville, N. C., and giving a detailed description of these manufacturing properties. The catalogue is a striking illustration of the systematic and thorough manner in which this firm of auctioneers places facts about their properties before prospective purchasers. It is a business which they have developed in recent years and the merits of their mthods are tested by the success of their sales. In addition to a detailed written description of the real etsate and equipment, this catalogue of the Ashley & Bailey Co.'s plants contains ground plans of each plant and the neighboring properties, also numerous half-tone illustrations of the exterior and interior of the buildings, giving the reader an excellent idea of the property in advance of an actual inspection.

RUNNING MOTOR TRUCKS WITH LOW GRADE FUEL

Twenty-four hours and forty minutes was the wonderfully fast time of a loaded 1500 pound Kissel Kar truck in a run made last week from Los Angeles to San Francisco. The manufacturers state that this excels the best previous record over the same course by more than six hours and is considered a most remarkable achievement in every way.

The car, a stock truck with no special equipment save a carburetor designed to burn low-grade fuel, was driven by O. W. Kern of the Pacific Kissel Kar branch and was loaded with a consignment of oil. The distance traveled was 472 miles.

One aspect of Kern's great accomplishment will interest truck owners throughout the United States. This was the successful use of "oil toppings" for fuel. "Oil toppings" is one of the very lowest grades of fuel. It is usually drained from the refining tanks and either thrown away or burned in furnaces. Its market price in California is three cents a gallon. With the use of a specially constructed carburetor this fuel was used with complete success. The amount consumed on the trip was 46 1/2 gallons costing less than $1.40

BRANCH IN GALVESTON, TEX.

The business enterprise which characterizes the H. W. Johns-Manville Co. is shown by the opening of a new office and warehouse in Galveston, Tex. This company now has three offices in Texas, at Houston, Dallas and Galveston. At the last named place, in a modern brick warehouse of large proportions, will be consolidated the stock for distribution to the different offices and throughout the Texas territory.

Galveston, because of its location and shipping facilities, makes an ideal concentration center. The company plans to receive direct at this point heavy shipments by steamship lines from New York. The steadily increasing trade with Central and South America also makes Galveston a convenient point of distribution.

The H. W. Johns-Manville Company is among the country's largest houses dealing in roofing, building materials, packings, pipe coverings, insulating materials and electrical goods, and is the world's largest manufacturer and distributor of asbestos goods. This concern owns extensive asbestos mines in Danville, P. Q., Canada, and has nine factories located in various cities throughout the United States.

BONUS ON AUSTRALIAN TOPS

A protest was made during the past season by the Sydney woolscourers, fellmongers, basil-tanners, carcase butchers and meat exporters against the continuance of the bonus granted by the Federal Government on the export of locally manufactured wool tops. A pamphlet issued sought to prove that as the amount of bonus increased the value of wool exported decreased, and that the more cheaply the Australian bounty-fed tops were put on the Japanese and other markets the more cheaply the woolbuyers who competed for the top trade sought to purchase Australian wool. It was contended that this recoil was inevitable, and that while the bonus benefited one or two companies, its effect was to lessen the value of wool in the Commonwealth.

While admitting that it was laudable to develop the manufacturing side of the wool industry in Australia, it was claimed that such development should be on sound economic as well as good business lines, and that any bounty or subsidy should lead to the employment of a large number of people. "Obviously," the objectors stated, "it is bad public policy to provide money to depreciate the value of the raw wool that yields twenty-five millions sterling per annum."

It was further contended that the effect of the bounty was to enable the few reaping its benefits to cut in and undersell with cheap tops the woolcombers of the world who bought their raw wool in Australia, and that this was never anticipated by the Federal Government.

The attitude of local objectors was backed up to some extent by the Bradford view. At the last annual meeting of the Bradford Wool and Noil Association a protest was made against the Federal Government subsidizing the exports of tops, the bounty being viewed by the Bradford top makers as an unfair one. One of the speakers at the meeting even went so far as to declare that it was high time the Imperial Government drew attention to the disadvantage under which the action of the Commonwealth Government was placing Bradford.

The Federal Government, however, has stood to the local topmakers and turned down the objectors. The Minister for Customs stated that an inquiry has shown that the bounty on wool tops was "beneficial to the producer of wool tops and to the workers in the industry," and declared that it would be extended for a further two years at the expiration of the present bonus.—Dalgety's Review.

SIZING EXPERIMENTS

A Southern mill recently wrote the Seydel Mfg. Co., Jersey City, N. J., as follows:

"We find, after a series of thirteen tests of 'Sizol,' covering a period of four days, that the sized yarn on the first of the kettle gains 10.29 per cent. over the raw yarn in breaking strength and 7.67 per cent. in weight, and on the last of the kettle it gains 14.23 per cent. in strength and 8.10 per cent. in weight, thus making a gain in the last of the kettle over the first of 38.2 per cent. in strength and 5.6 per cent. in weight."

This suggested to them the inquiry as to whether or not manufacturers boil their size long enough, as the last of the kettle gives such a substantial gain in strength and weight over the first of the kettle. An increase in breaking strength of 14.23 per cent. with 8.10 per cent. in size is an interesting and striking result.

THE NEW KNITTING MILL OF THE VASSAR SWISS UNDERWEAR CO.

Work has begun on the new factory building of the Vassar Swiss Underwear Co., which will cover the entire block bounded by Diverset Boulevard, Rockwell St., Maplewood Ave., and the Chicago and Northwestern Railway track. The building will be four stories in height, and when completed will contain about six acres of floor space and represent an investment of $750,000.

The entire building will be occupied by the Vassar Swiss Underwear Co. This company was organized some ten or twelve years ago, and was originally located in Chicago. Later its business was removed to Rochelle, Ill. It is said that the new building will be the finest knitting mill in the world. In the construction of the building everything is being planned for the comfort and convenience of the employes. Expanded metal steel locks, drinking fountains and all other modern conveniences will be included. In addition there will be a large lunch room, rest rooms, reading rooms, etc. It is expected that the plant can be put into operation shortly after the first of the year.

INSTALLING WATER SOFTENER

The Pioneer Cotton Mills of Guthrie, Okla., have contracted with the Dodge Manufacturing Company, Mishawaka, Ind., for a No. 14 "Eureka" water softener with 1,500 gallons per hour capacity.

Recent Textile Patents

BRAIDING MACHINE. 1,073,308. Simon W. Wardwell, Providence, R. I.

BRAIDING MACHINE. 1,073,558. Oscar A. Albrecht, Omaha, Neb.

CLOTH CUTTING Machine. 1,071,521. Stanley Hardy, St. Louis, Mo.

DYEING LOOSE Textile Goods, Apparatus for. 1,071,022. Waldemar Berger, Hoechst-on-the-Main, Germany.

DYEING MACHINE. Circulating. 1,072,662. Walter W. Sibson, Philadelphia, Pa.

FABRIC BORDERS, Forming Crochet-stitch. 1,072,086. William H. Carter, Needham Heights, Mass.

FABRIC HOLDER and Exhibitor. 1,073,519. Frank A. Raabe, Stanton, Neb.

FABRIC-LOOP Drier and Feed for Same, Automatic. 1,071,651. Bertrand A. Parkes, Barren Hill, Pa.

FABRICS, Drying Plant for Textile. 1,072,512. Silvio Schewczik, San Remo, Italy.

FABRICS, Mechanism for Cutting Pile Loops in the Manufacture of Coarse Pile. 1,072,842. Ernest J. Entwisle, London, Eng.

KNIT FABRIC Having a Welt and Making the Same. 1,071,019. Robert W. Scott, Leeds Point, N. J.

KNITTED BIAS Lace Knitted Neckties. 1,072,735. Josef Kellner, Brooklyn, N. Y.

KNITTED GARMENT. 1,072,640. Max Nydegger, Elizabeth, N. J.

KNITTED NECKTIE. 1,072,471. Josef Kellner, Brooklyn, N. Y.

KNITTED NECKTIE. Bias Lace. 1,073,050. Josef Kellner, Brooklyn, N. Y.

KNITTING MACHINE. 1,072,639. Max Nydegger, Elizabeth, N. J.

KNITTING MACHINE. 1,071,979. Frank B. Wildman, Norristown, Pa.

KNITTING MACHINE. 1,073,309. Frank Wilcomb, Norristown, Pa.

KNITTING MACHINE. 1,072,365. Walter F. Rolston, Rockford, Ill.

KNITTING MACHINE Stop Motion. 1,071,910. Robert C. Gruber, Spring City, Pa.

KNITTING MACHINE Using Double-ended Latch Needles, Circular Fashioning. 1,073,885. William H. Beale, Wellington, N. Z.

KNITTING NECKTIES and Scarfs. 1,072,856. Josef Kellner, Brooklyn, N. Y.

LOOM. 1,071,245. Louis H. Landry, Uxbridge, Mass.

LOOM. 1,072,877. Robert W. Schrey, Philadelphia, Pa.

LOOM. 1,071,368. Edward Stutz, Philadelphia, Pa.

LOOM for Weaving Oriental Knotted Fabrics. 1,072,885. Thomas P. Walsh, Boston, Mass.

LOOM for Weaving. 1,073,145. Albert G. Koechlin, Basel, Switzerland.

LOOM Pattern Mechanism. 1,073,635. Eppa H. Ryon, Waltham, Mass.

LOOM Picker Check. 1,071,613. Millard F. Field, Winthrop, Mass.

LOOM, Ribbon. 1,072,944. Jakob Haeusermann, Stetten, Germany.

SHUTTLE, Hand-threading Antisuction. 1,071,039. Edwin H. Ford, New Bedford, Mass.

RECENT TEXTILE TRADE-MARKS REGISTERED

69,307. Piece fabrics of silk. Mark: Cascadeuse. Owner: Atuyer, Bianchini, Ferier, Lyon, France.

70,138. Woven piece goods. Mark: Tivoli. Owner Alexander I. Mitchell, Stafford Springs, Conn.

56,317. Percale. Mark: Century. Owner: Wm. Anderson & Co., New York.

64,278. Shirts, drawers, hosiery, sweaters, etc. Mark: Cfeatures. Owner: Edward J. Schremp, Utica, N. Y.

70,260. Imitation astrakhans. Mark: Perlambs. Owner: Joseph Benn & Sons, Greystone, R. I.

70,698. Cotton batting. Mark: Jewel. Owner: Rock River Cotton Co., Janesville, Wis.

71,761. Cotton piece goods. Mark: Nebulette. Owner: Lorraine Mfg. Co., Pawtucket, R. I.

71,207. Carpets. Mark: Windsor Brussels. Owner: Cochrane Mfg. Co., Dedham, Mass.

68,809. Bunting. Mark: Sterling. Owner: Annin & Co., New York.

68,716. Silk piece goods. Mark: Columbine. Owner: The H. B. Claflin Co., New York.

68,867. Hosiery. Mark: Rival. Owner: Less & Arenson Co., Little Rock, Ark.

69,702. Knitted union suits and drawers. Mark: Pandora. Owner: Julius Hirsh, Philadelphia, Pa.

69,741. Hosiery. Mark: Marode. Owner: Lord & Taylor, New York.

69,810. Cotton piece goods. Mark: Shawmut. Owner: Tremont & Suffolk Mills, Lowell, Mass.

70,429. Cotton cloth. Mark: ChaVois. Owner: American Lady Corset Co., Detroit, Mich.

71,069. Cotton thread. Mark: "Seasilk." Owner: The Hughes Mfg. Co., Philadelphia, Pa.

71,185. Mercerized thread. Mark: Rival. Owner: Sea Island Thread Co., New York.

71,656. Cotton and wool piece goods. Mark: M. S. Co. Owner: John B. Ellison & Sons, Philadelphia, Pa.

71,864. Hosiery and knitted underwear. Mark: Lady Gay. Owner: E. M. Townsend & Co., New York.

C. E. RILEY COMPANY

65 Franklin Street, .. BOSTON, MASS.

COTTON AND COTTON GOODS YARNS

DIRECT IMPORTERS OF EGYPTIAN COTTON

COTTON WOOLEN WORSTED MACHINERY

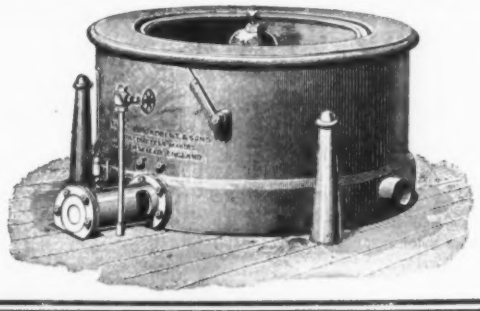
Thomas Broadbent & Sons,

Huddersfield, Eng.

PATENT DIRECT STEAM DRIVEN

HYDRO-EXTRACTORS

OVER 3500 IN USE. ALSO ELECTRICALLY DRIVEN



SUSPENDED ON LINKS. REQUIRING NO EXPENSIVE FOUNDATIONS.

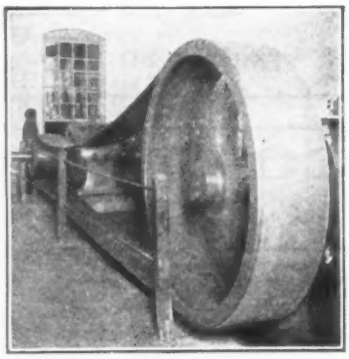
C. E. RILEY COMPANY, Sole Agents 65 Franklin St., Boston, Mass.

Machines Kept in Stock in Boston

I "DON'T CARE"

Many belt operatives express this sentiment when we show them their belts are improperly handled, unscientifically managed, and a cause of large money loss, which is preventable.

We advocate Cling-Surface treatment and *guarantee* best results obtainable. Still, after explaining the benefits derivable from slack belts from A to Z, offering valuable suggestions, and offering to take no money whatever for Cling-Surface if it doesn't do all we say, many men give it little thought and often say, "I don't care. My belts give me a lot of trouble, that's true, but I haven't time to think of them."



The man who DOES care uses Cling-Surface and it pays him well!

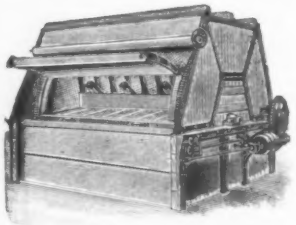
Every managing engineer who is keen as he should be in showing profits from his plant *must* give all the belting and transmission ropes systematic attention. And Cling-Surface treatment is the one logical method of constantly maintaining high transmission efficiency and prolonging the life of the whole transmission system.

The soft clean clinging belt surface resulting from the use of Cling-Surface permits a slackening without slip, that produces even greater economies outside than inside the belt.

Put Cling-Surface on just one tight belt for a trial. Select one that has been slipping badly, running off or wearing rapidly, and you will find Cling-Surface highly beneficial. Ask us for examples from plants where Cling-Surface has demonstrated itself to be indispensable.

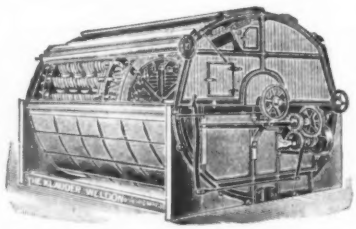
Cling-Surface Company 1051 Niagara St Buffalo N Y
New York Boston Chicago Denver Memphis Etc

69



Raw Wool and Cotton Machine.

MACHINES
sold on
2 MONTH'S TRIAL
YOU
TAKE
NO
RISK

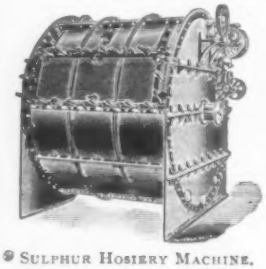


Skein and Slubbing Machine.

KLAUDER-WELDON DYEING MACHINE COMPANY

HUDDERSFIELD, ENGLAND. *AMSTERDAM, N. Y.*

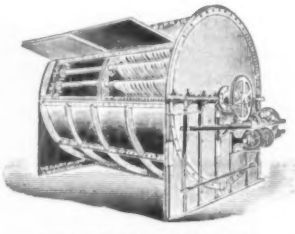
Machines for Dyeing, Bleaching and Scouring Woolen, Worsted, Cotton and Silk Skeins — Slubbing — Raw Cotton and Wool, Waste, Rags, Shoddy, Hosiery, Underwear, Hats, Caps, Knit Cloth, Tapes, etc.



Sulphur Hosiery Machine.

Special Machines for Sulphur Colors

WILL EARN THEIR COST IN LABOR ALONE
IN FROM
6 TO 12 MONTHS
ACCORDING TO CAPACITY



Sulphur Skein Machine.

Buyers' Index

This department is conducted for the benefit of our subscribers. The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisements. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in the classification here given such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources. Advertisers whose names do not appear under headings to which they are entitled will please notify the publishers.

Accountants and Systematizers.
Gunn, Richards & Co.

Air Moistening System.
——See Humidifying Apparatus.

Aligning and Leveling Apparatus.
Kinkead Mfg. Co.

Architects and Mill Engineers.
Cramer, Stuart W.
Dyer, W. E. S.
Ferguson, John W.
Main, Chas. T.
Myrick, J. W. H.
Weston, Robert Spurr.

Asbestos Products.
Johns-Manville Co., H. W.

Asphalt Tanks.
Graver Tank Works, Wm.
Scaife, W. B., & Sons.

Auctioneers.
Conant, J. E., & Co.

Auto Trucks.
General Vehicle Co.

Automatic Feeds for Cotton and Wool.
Harwood, Geo. S., & Son.
Leigh & Butler.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Saco-Lowell Shops.
Sargent's, C. G., Sons.
Schofield, Wm., Co.
Woonsocket Machine & Press Co.

Baling Presses.
Boomer & Boschert Press Co.
Philadelphia Drying Mchy. Co.

Ball Bearings.
Hess Bright Mfg. Co.
New Departure Mfg. Co.
S. K. F. Ball Bearing Co.

Bandings.
Lambeth Rope Corporation.
Sternberg, Fred, & Co.

Baskets.
Lane, W. T., & Bro.

Beams (Steel).
Mossberg, Frank, Co.

Beamers.
Crompton & Knowles Loom Works.
Knapp, C. H.

Belting.
Bond, Chas., Co.
Boston Belting Co.
Gandy Belting Co.
Graton & Knight Mfg. Co.
Hood, R. H., Co.
—See also Mill Supplies.

Belt Cement.
Graton & Knight Mfg. Co.

Belt Dressing.
Cling-Surface Co.
Dixon, Jos., Crucible Co.
Graton & Knight Mfg. Co.
Stephenson Mfg. Co.

Belt Hooks.
Clipper Belt Lacer Co.

Belt Lacing Machines.
Clipper Belt Lacer Co.

Belt Tighteners.
American Tool & Machine Co.
Dodge Mfg. Co.
Hunter, James, Machine Co.

Bindings.
——See Tapes and Braids.

Bleaching Eyes.
Boston Belting Co.

Bleaching Kiers.
Arlington Mch. Wks.
Birch Bros. (Albert Birch, prop.).
Buhlmann, A. W.
Lockwood Manufacturing Co., The.
Philadelphia Drying Machinery Co.
Stearns Lumber Co., A. T.
Textile-Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Electro Bleaching Gas Co.
Marston, John P.
Roessler & Hasslacher Chemical Co.
Seydel Mfg. Co., The.
Worden Chemical Co.

Blowers and Blower Systems.
Autoforce Ventilating System.
Carrier Air Conditioning Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Bobbins, Spools, Shuttles, Etc.
American Supply Co.
American Textile Specialty Mchy. Co.
Leigh & Butler.
Mossberg, Frank, Co.
Tebbets, E. L., & Co.

Bobbin Winders.
Altemus, J. K.
Lever, Oswald, Co.
Universal Winding Co.

Boilers.
——See Steam Boilers.

Books.
Addison Press.

Boxes, Box Shooks, Etc.
Pearson, J. T.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass Hinges.
Root, C. J., Co.

Bridges.
Scaife, W. B., & Sons.

Burlers, Speckers, Menders.
Providence Mending Co.

Brushers.
——See Napping Machines.

Brushes.
Cocker, M., & Co.
Felton, S. A., & Son Co.
Mason Brush Works.
Parks & Woolson Machine Co.

Brushing Machines.
Buhlmann, A. W.
Parks & Woolson Machine Co.

Buckets, Grab.
Hunt, C. W., Co., Inc.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.

Button-Hole Machines.
Reece Button-Hole Machine Co.

Button Sewing Machines.
Union Button Sewing Machine Co.

Cableways.
Hunt, C. W., Co., Inc.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Lockwood Manufacturing Co., The.
Schwartz, L. H. A., & Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Taunton-New Bedford Copper Co.
Textile-Finishing Machinery Co.
——See also Dyeing, Drying, Bleaching, Machinery, etc.

Canvas Baskets.
Lane, W. T., & Bro.

Cap Spindles.
American Textile Specialty Mchy. Co.
Hall, F. A. & P.

Carbonizing Machinery.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Lockwood Manufacturing Co., The.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schwartz, L. H. A., & Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Textile-Finishing Machinery Co.
Tolhurst Machine Works.

Card Clothing.
Ashworth Bros.
Buhlmann, A. W.
Firth, William, Co.
H. & B. American Machine Co.
Leigh & Butler.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Schwartz, L. H. A., & Co.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Buhlmann, A. W.
Dronsfield Bros.
Entwistle, T. C., Co.
Firth, William, Co.
Leigh & Butler.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Smith & Furbush Machine Co.

Carpet Machinery.
Altemus, Jacob K.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Parks & Woolson Machine Co.
Philadelphia Textile Machinery Co.
Smith & Furbush Machine Co.
Textile-Finishing Machinery Co.

Cars, Industrial.
Hunt, C. W., Co., Inc.

Castings.
Dodge Mfg. Co.
Hunter, James, Machine Co.
Lunkenheimer Co., The.
Schofield, Wm., Co.

Caustic Soda.
Wing & Evans.

Cell Driers.
Cell Drier Machine Co.

Cement Pans.
Scaife, W. B., & Sons.

Chain Belts.
Morse Chain Co.
Peerless V Belt Co.

Chemists.
Little, Arthur D., Inc.

Chenille Machinery.
Eppler's, John, Machine Works.

Cling Surface.
Cling-Surface Co.

Clocks.
Pettes & Randall Co.
Watchman's Clock & Supply Co.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Richardson Brothers.
Textile-Finishing Machinery Co.

Cloth Cutting Machines.
Firth, William, Co.
Oswego Machine Works.

Cloth Dryers.
——See Drying Machinery.

Cloth Expanders.
American Finishing Machinery Co.
Arlington Mch. Wks.
Birch Bros. Somerville Machine Wks. (Albert Birch, prop.).
Leyland, Thomas, & Co.
Lockwood Manufacturing Co., The.
Somerville Mach. Wks. (Albert Birch, prop.).

Cloth Shrinking Machinery.
Reliance Machine Works.

Cloth Testers.
Firth, William, Co.
Perkins, B. F., & Son, Inc.
Scott, Henry L., & Co.
Suter, Alfred.

Alphabetical Index to Advertisers, with page numbers, follows this list.

Cloth Winders.
American Finishing Machinery Co.
Firsching, J. A.
Parks & Woolson Machine Co.

Clutches.
American Tool & Machine Co.
Dodge Mfg. Co.
Hunter, James, Machine Co.

Coal Analysis.
Little, A. D., Inc.

Coal and Ash Handling Machinery.
Hunt, C. W., Co., Inc.

Cold Sawing Machine.
Burr & Son, John T.

Combs (Wool and Cotton).
Crompton & Knowles Loom Works.
Firth, William, Co.
Hood, R. H., Company.
Leigh & Butler.
Richards, Atkinson & Haserick.
Riley, C. E., Company.

Commercial Vehicles.
Kissel Motor Car Co.

Compressors (Air).
Allis-Chalmers Mfg. Co.

Condensers.
Allis-Chalmers Mfg. Co.
Dean Bros. Steam Pump Works.

Cones (Paper).
American Textile Specialty Mchy. Co.
Fairpoint Corporation.

Conditioning and Testing.
U. S. Conditioning & Testing Co.

Conveying Systems.
Dodge Mfg. Co.
Hunt, C. W., Co., Inc.
Sturtevant, B. F., Co.

Coolers (Air).
Power Specialty Co.

Cop Machinery.
Eppiers, John, Mach. Works.

Cop Tubes.
American Textile Specialty Mchy. Co.
Fairpoint Corporation.
——See Paper Tubes.

Copper Expansion Joints.
Badger, E. B., & Sons Co.

Copper Print Rollers.
Taunton-New Bedford Copper Co.

Coppersmiths.
Badger, E. B., & Sons Co.
Textile-Finishing Machinery Co.

Copper Work for Dyers.
Badger, E. B., & Sons Co.
Butterworth, H. W., & Sons Co.
Textile-Finishing Machinery Co.

Corduroy and Velvet Cutting Machines.
Firth, William, Co.

Corrugated Iron and Steel.
Scaife, W. B., & Sons.

Cotton.
Riley, C. E., Company.
Schwartz, L. H. A., & Co.

Cotton Dryers.
——See Drying Machinery.

Cotton Machinery.
American Textile Specialty Mchy. Co.
Ashworth Bros.
Barber-Colman Co.
Brown Spin-Wright Cotton Co.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cramer, Stuart W.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Dixon Lubricating Saddle Co.
Draper Company.
Easton-Burnham Co.
Elliot & Hall.
Entwistle, T. C., Co.
Fales & Jenks Mch. Co.
Firth, William.
H. & B. American Machine Co.
Kilburn, Lincoln & Co.
Klauder-Weldon Dyeing Machine Co.
Leigh & Butler.
Mason Machine Works.
Metallic Drawing Roll Co., The.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Potter & Johnston Mch. Co.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Saco-Lowell Shops.
Schwartz, L. H. A., & Co.
Smith & Furbush Machine Co.
Stafford Co., The.
Textile-Finishing Machinery Co.
Textile Machinery Co.
Whitin Machine Works.
Wildman Mfg. Co.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Firth, William, Co.
H. & B. American Machine Co.
Leigh & Butler.
Potter & Johnston Mch. Co.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Saco-Lowell Shops.

Cotton Softeners.
Bosson & Lane.
Harding & Fancourt, Inc.
Marston, John P.
Seydel Mfg. Co., The.

Cotton Waste Machinery.
Firth, William, Co.
Saco-Lowell Shops.

Counting Machines.
Beck, Chas., Co.
Durant Co., W. N.
Root, C. J., & Co.

Couplings (Flexible-Insulated).
Bond Co., Charles.

Crayons.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutting Machines.
Artos Engineering Co.
Beck, Chas., Co.
Eastman Machine Co.
Firsching, J. A.
Oswego Machine Works.
Perkins, B. F., & Son, Inc.

Cylinder Oil (Superheated Steam).
Power Specialty Co.

Disinfectants.
Seydel Mfg. Co., The.

Dobbies.
Crompton & Knowles Loom Works.
Kilburn, Lincoln & Co.
Stafford Co., The.

Drawing Rolls.
Hood, R. H., Company.
H. & B. American Machine Co.
Metallic Drawing Roll Co., The.

Drying Boards.
Pearson, J. T.
Philadelphia Drying Mchy. Co.

Drying Machinery.
American Tool & Machine Co.
Arlington Mch. Wks.
Bailey, Frank.
Birch, Albert, Somerville Mach. Wks.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cell Drier Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schwartz, L. H. A., & Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Sturtevant, B. F., Co.
Textile-Finishing Machinery Co.
Tolhurst Machine Works.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Firth, Wm.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Dyers, Bleachers and Finishers.
Aberfoyle Mfg. Co.
Brophy's, T., Sons.
Davidson, John F.
Franklin Process Co.
Globe Dye Works Co.
Home Bleach & Dye Works.
Hopkinson Dyeing & Textile Works.
Lorimer's, The Wm. H., & Sons Co.
National Silk Dyeing Co.
Peerless Co.
Utica Willowvale Bleaching Co.

Dyeing, Drying, Bleaching and Finishing Machinery.
American Finishing Machinery Co.
American Tool & Machine Co.
Arlington Mch. Wks.
Autoforce Ventilating System.
Birch, Albert, Somerville Mach. Wks.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cell Drier Machine Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Franklin Process Co.
Giles, J. H., Dyeing Machine Co.
Heathcote, John, & Son.
Hunt, Rodney, Mach. Co.
Hunter, James, Machine Co.
Hussong Dyeing Machine Co.
Kenyon, D. R., & Son.
Klauder-Weldon Dyeing Machine Co.
Klipstein, A., & Co.
Leigh & Butler.
Leyland, Thos., & Co.
Lockwood Manufacturing Co., The.
National Laundry Machinery Co.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Pearski Dyeing Machine Co.
Reliance Machine Works.
Schwartz, L. H. A., & Co.
Smith, Drum & Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Sturtevant, B. F., Co. (Drying).
Sucker, G.
Suter, Alfred.
Textile-Finishing Machinery Co.
Tolhurst Machine Works.
U. S. Hoffman Co.

Dye House Cans.
Hill, James, Mfg. Co.

Dye House Trucks.
Bailey, Frank.

Dye Kettles.
Stearns, A. T., Lumber Co.

Dye Sticks.
Bailey, Frank.
Klauder-Weldon Dyeing Machine Co.

Dye Tubs.
——See Tanks, Tubs and Vats.

Dyestuffs and Chemicals.
American Dyewood Co.
Atteaux, F. E., & Co.
Badische Co.
Bayer Co., The, Inc.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Campbell, John, & Co.
Cassella Color Co.
Electro Bleaching Gas Co.
Farbwerke-Hoechst Co.
Harding & Fancourt, Inc.
Innis Speiden & Co.
Kalle & Co.
Ford, J. B., Co.
Geisenheimer & Co.
Holliday Read & Sons, Ltd.
Johnson, Chas. A., & Co.
Klipstein, A., & Co.
Leyland, Thos., & Co.
Malt-Diastase Co.
Marston, John P.
Roessler & Hasslacher Chemical Co.
Seydel Mfg. Co.
Stein, Hirsh & Co.
Sykes, Walter F., & Co.
Thayer, Ed M., & Co.
Wing & Evans, Inc.
Wolf, Jacques & Co.
Worden Chemical Co.

Dynamos.
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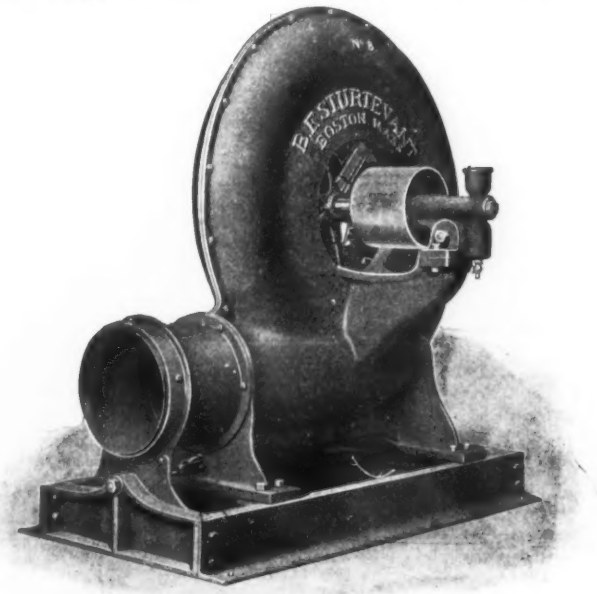
40 Years' Continuous Service and the Bearings Still in Good Condition



STEEL PRESSURE BLOWER, ONE TYPE OF

Sturtevant Stock Fans

REG. U. S. PAT. OFF.

Read this letter from the Master Mechanic of the Georgia Railroad:—

"We have a No. 7 Sturtevant Fan, which we have had about 40 years. It has just given out; that is, the fan part has worn out; the shaft, bearings, etc., are all in good condition. All we want is the moveable part of the fan. Can you furnish it to us? Please advise us promptly. I have endeavored to find some date on it, but there appears to be nothing on it except the size No. 7, and your advertisement in raised letters."

WHY THEY LAST

The best materials only are used in their construction. The wheels are carefully balanced, the shafts are made of the best quality steel, turned and ground to exact size, the bearings are large and lined with the highest grade anti-friction metal.

Sturtevant Stock Fans are built in all types and sizes and are carried in stock ready for immediate shipment at our works at Hyde Park, Mass., and at our Philadelphia, Chicago and San Francisco warehouses.

Bulletin No. 134T describes these fans in detail.

B. F. STURTEVANT COMPANY, Hyde Park, Boston, Mass.

And All Principal Cities of the World

Edgings.
—See Tapes, Braids and Edgings.

Electrical Construction.
Allis-Chalmers Mfg. Co.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electrical Heating Devices.
General Electric Co.

Electrical Supplies.
Johns-Manville Co., H. W.

Electric Driven Pumps.
Allis-Chalmers Mfg. Co.
Dean Bros. Steam Pump Works.
General Electric Co.

Electric Fans.
Allis-Chalmers Mfg. Co.
General Electric Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Hoists.
Allis-Chalmers Mfg. Co.
General Electric Co.

Electric Lighting.
Allis-Chalmers Mfg. Co.
Cooper Hewitt Electric Co.
General Electric Co.
Hinsdill Electric Co.
Johns-Manville Co., H. W.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Allis-Chalmers Mfg. Co.
Day, E. B.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electrolyzer.
National Laundry Machinery Co.

Elevators.
Craig Ridgway & Sons Co.
Economy Engineering Co.
N. Y. Revolving Portable Elevator Co.
Salem Elevator Works.

Elevator Buckets.
Hunt, C. W., Co., Inc.

Employes' Time Recorders.
Pettes & Randall Co.

Engines.
—See Steam and Oil Engines.

Engines, Hoisting.
Hunt, C. W., Co., Inc.

Exhaust Heads.
Sturtevant, B. F., Co.
Power Specialty Co.

Exhibits.
Textile Exhibitors' Ass'n, Inc.

Fans—Exhaust and Ventilating.
—See Ventilating Apparatus.

Feed Water Heaters.
Scaife, W. B., & Sons.

Feed Water Pumps.
Dean Bros. Steam Pump Works.
Goulds Mfg. Co.

Feed Water Purifiers.
American Water Softener Co.
Scaife, W. B., & Sons.

Feeds.
—See Automatic Feeds.

Felt Hardeners.
Farrel Foundry and Machine Co.

Felt Rotary Washers.
Hunt, Rodney, Machine Co.

Felting Machinery.
Farrel Foundry and Machine Co.
Hunt, Rodney, Machine Co.

Fender Boards.
Case Bros.

Filters.
American Water Softener Co.
Graver Tank Works, Wm.
Hungerford & Terry.
Norwood Engineering Co.
Scaife, W. B., & Sons.

Finishing Compounds.
—See Sizings.

Finishing Machinery.
—See Dyeing, Drying, Bleaching and Finishing.

Fire Brick.
Borgner, Cyrus, Co.
Johns-Manville Co., H. W.

Fire Extinguishers.
Badger, E. B., & Sons Co.
Johns-Manville Co., H. W.

Fire Hose.
Boston Belting Co.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Insurance.
Home Insurance Co.

Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combe-Barbour, Ltd.
Haskell-Dawes Machine Co.

Fluted Rolls.
Firth, William, Co.
Hood, R. H., Company.
H. & B. American Machine Co.
Leigh & Butler.
Metallic Drawing Roll Co.
Riley, C. E., Company.
Thurston, A. G., & Son.

Flyers.
Bodden, Wm., & Son, Ltd.
Firth, William, Co.
Hall, F. A. & P.
H. & B. American Machine Co.
Leigh & Butler.
Textile Machinery Co.

Forges.
Sturtevant, B. F., Co.

Friction Clutches.
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Friction Cones.
Evans Friction Cone Co.

Fuel Economizers.
Sturtevant, B. F., Co.

Fulling Mills for Woolen Goods.
Hunt, Rodney, Mach. Co.
Hunter, James, Mach. Co.
Kenyon, D. R., & Son.

Furnace Bars.
Mellor Furnace Engineering Co.

Furnaces (Automatic Smokeless).
Murphy Iron Works.

Garnetts.
Hunter, James, Machine Co.
Leigh & Butler.
Smith & Furbush Machine Co.

Garnetted Stock.
Graves, Frank B.

Gas Blowers and Exhausters.
Sturtevant, B. F., Co.

Gas Engines.
Allis-Chalmers Mfg. Co.

Gaskets (Superheated Steam).
Johns-Manville Co., H. W.
Power Specialty Co.

Gauges.
Lunkenheimer Co., The.

Gears.
New Process Gear Corporation.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Allis-Chalmers Mfg. Co.
General Electric Co.
Sturtevant, B. F., Co

Geyser Water Heater.
Sargent's Sons, C. G., Corp.

Greases.
Borne, Scrymser Co.
N. Y. & N. J. Lubricant Co.
Royersford Foundry & Machine Co.

Hangers.
—See Power Transmision Machinery.

Harness Twine.
Moore, C., & Co.

Harness and Frames.
Garland Mfg. Co.
Steel Heddle Mfg. Co.

Heating.
—See Ventilating Apparatus.

Heddles.
American Supply Co.
Firth, William, Co.
Richards, Atkinson & Haserick.
Steel Heddle Mfg. Co.

Hoists.
—See Engines, Hoisting.

Hoisting Apparatus.
Economy Engineering Co.
Hunt, Rodney, Machine Co.
N. Y. Revolving Portable Elevator Co.

Hose.
Boston Belting Co.

Hosiery Boards.
Pearson, J. T.
Philadelphia Drying Machinery Co.

Hosiery Labels.
Kaumagraph Co.
Meyercord, H. A., Co.
Palm Fechteler & Co.

Humidifying Apparatus.
American Moistening Co.
Carrier Air Conditioning Co. of America.
Cramer, Stuart W.
International Moistening Co.
Parks, G. M., Co.

Humidity Controller.
American Moistening Co.
Cramer, Stuart W.

Humidity Gauge.
Johns-Manville Co., H. W.

Hydraulic Rams.
Power Specialty Co.

Hydraulic Testing Machines.
Knapp, C. H.

Hydro Extractors.
American Tool & Machine Co.
Broadbent, Thomas, & Sons.
Riley, C. E., Co.
Richards, Atkinson & Haserick.
Schaum & Uhlinger, Inc.
Schwartz, L. H. A., & Co.
Tolhurst Machine Works.

Industrial Railways.
Hunt, C. W., Co., Inc.

Insulating and Braiding Silks.
Chauquoit Silk Mfg. Co.

Insurance (Casualty, Fire and for Loss of Profits).
Home Insurance Co.
—See Liability Insurance.

Jacquards.
Crompton & Knowles Loom Works.
Halton's, Thomas, Sons.

Jacquard Cards.
Case Bros., Inc.
Lane, Albert A.

Keyseating Device.
Burr & Son, John T.

Keyway Broaching Machine.
Burr & Son, John T.

Knit Goods Dryers.
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Knit Goods, Edgings, Trimmings, Etc.
Chapin, George W.
Cheney Bros.
Friedberger-Aaron Mfg. Co.
Hall Lace Co.
Jenkins, E. Wheeler.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Artos Engineering Co.
Hunt, Rodney, Machine Co.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Spindler, E. O.
Union Special Machine Co.

Knitting Machine Cylinders.
Fidelity Machine & Mfg. Co.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Acme Knitting Machine & Needle Co.
Ainslie Knitting Machine Co.
Ames Knitting Machine Co., A. N.
Boss Knitting Machine Co.
Brinton, H., & Co.
Claes & Flentje.
Cooper, Charles.
Crane Mfg. Co.
Epplers, John, Mach. Works.
Fidelity Machine & Mfg. Co.
General Machine Works.
Gormly, Robt. W., & Co.
Grosser Knitting Machine Co.
Hemphill Mfg. Co.
Jenckes Knitting Mach. Co.
Lamb Knitting Machine Mfg. Co.

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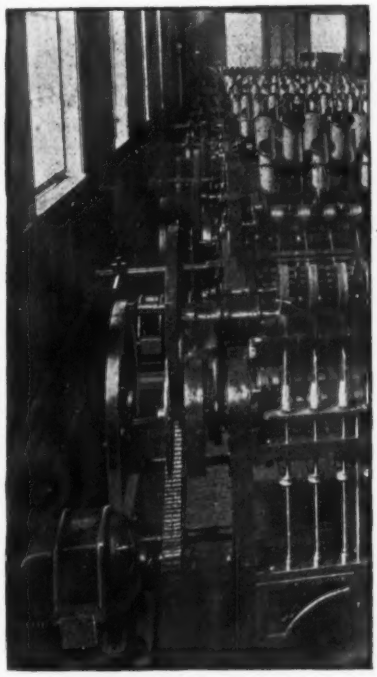

INCREASE YOUR PRODUCTION

BY USING

Morse Flexible Gearing

This form of transmission is **Durable, Silent, Highly Efficient,** provides a **Positive** speed ratio and runs with a **Minimum** amount of care and attention.

The installation of the spinning frame drives shown here **Increased the Production** in this room by keeping the cylinder shafts absolutely up to speed at all times.

The service obtained from these **Morse Silent Chains** was upwards of **12,000 Hours. No other form of Transmission** has ever approached this record in connection with the individual motor equipment.

We now have in successful operation drives transmitting an aggregate of over 500,000 H. P. Individual drives running from 1 H. P. to 2000 H. P. each.

Let us figure on some of your power transmission problems.

Our Bulletin No. 9B is particularly interesting.

MORSE CHAIN CO, Ithaca, N.Y.

N. E. Branch, 141 Milk St., Boston

Leighton Machine Co.
Nye & Tredick Co.
Paxton & O'Neill.
Scott & Williams, Inc.
Spindler, E. O.
Stafford & Holt
Standard Machine Co.
Taylor, James.
Textile Machine Works.
Tompkins Bros. Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Machinery (Full Fashioned).
Hirsch, Louis.
Grosser Knitting Machine Co.
Spindler, E. O.
Textile Machine Works.
Walther, Otto.

Knitting Needles and Supplies.
Acme Knitting Machine & Needle Co.
Breedon's, Wm., Sons.
Brinton, H., & Co.
Continental Latch Needle Company.
Cooper, Charles.
Crane Mfg. Co.
Excelsior Needle Co.
Grosser Knitting Machine Co.
Ives, L. T., Co.
Keystone Latch Needle Co.
Lamb Knitting Machine Mfg. Co.
Spindler, E. O.
Wardwell Needle Co.

Labeling Machines.
Acme Staple Co.

Label Wire Stitchers.
Beck, Charles, Co.
Shoemaker, J. L., & Co.

Laboratory Equipment.
Meteor Thermometer & Instrument Co.

Lace Leather.
Graton & Knight Mfg. Co.

Lace Machines.
Spindler, E. O.

Laces.
Jenkins, E. Wheeler.

Lamps, Electric.
General Electric Co.
Hinsdill Electric Co.
Johns-Manville Co., H. W.
Westinghouse Electric & Mfg. Co.

Lanterns.
Dietz, R. E., Co.

Liability Insurance.
Travelers Insurance Co.

Light Reflectors.
Hinsdill Electric Co.

Liquid Chlorine.
Electric Bleaching Gas Co.

Loom Pickers.
Garland Mfg. Co.
Graton & Knight Mfg. Co.

Looms.
Buhlmann, A. W.
Crompton & Knowles Loom Works.
Draper Company.
Kilburn, Lincoln & Co.
Leigh & Butler.
Mason Machine Works.
Richards, Atkinson & Haserick.
Saco-Lowell Shops.
Stafford Co., The.
Whitin Machine Works.

Loopers.
Grosser Knitting Machine Co.
Hepworth, John W., & Co.
Leighton Machine Co.

Lubricants.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Kellogg & Co., E. H.
N. Y. & N. J. Lubricant Co.
Royersford Foundry & Machine Co.
S. K. F. Ball Bearing Co.

Lubricators.
Lunkenheimer Co.

Lumpers.
Gerry, George, & Son.
Schofield, William, Co.

Machinery Dealers.
Taylor, James.

Machinists' Tools.
Whiton, The D. E., Co.

Magnesia Products.
Johns-Manville Co., H. W.

Marking Pots.
Bradley, A. J.

Measuring and Folding Machines.
Curtis & Marble Machine Co.
Elliot & Hall.
Parks & Woolson Machine Co.

Mechanical Draft.
Sturtevant, B. F., Co.

Mechanical Draughtsmen.
Dodge Mfg. Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Tool & Machine Co.
Dodge Mfg. Co.
Lockwood Manufacturing Co., The
Myrick, J. W. H.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Mechanical Stokers.
Murphy Iron Works.

Mercerizers.
Globe Dye Works Co.
Home Bleach & Dye Works.
Lorimer, Wm. H., Sons Co.

Mercerizing Machinery.
Buhlmann, A. W.
Butterworth, H. W., & Sons.
Klauder-Weldon Dyeing Machine Co.
Lockwood Manufacturing Co., The.
Schwartz, L. H. A., & Co.
Smith, Drum & Co.
Textile-Finishing Machinery Co.

Metallic Fire-Proof Window Frames and Sashes.
Badger, E. B., & Sons Co.

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Mill Builders and Engineers.
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Ferguson, John W.
Main, Charles T.

Mill Piping.
Parks Co., G. M.

Mill Supplies.
American Supply Co.
Pamford & Smith.
Bond, Chas., Co.
Buckley's, Benjamin, Sons.
Dodge Mfg. Co.
Easton & Burnham Mch. Co.
Eureka Fire Hose Co.
Field & Co., Inc.
Firth, William, Co.
Garland Mfg. Co.
Graton & Knight Mfg. Co.
Hess-Bright Mfg. Co.
Hood, R. H.
Lane, W. T., & Bro.
Leigh & Butler.
Lunkénheimer Co.
New Departure Mfg. Co.
N. Y. & N. J. Lubricant Co.
Fairpoint Corporation.
Philadelphia Drying Machinery Co.
Powell, Wm., Co.
Riley, C. E., Company.
Richards, Atkinson & Haserick.
Richardson Bros.
Stephenson Mfg. Co.
Thurston, A. G., & Son.

Millwrights.
Hunter, James, Machine Co.

Motors.
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Motor Trucks.
Kissell Motor Car Co.

Napping Machinery.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Curtis & Marble Machine Co.
Leigh & Butler.
Parks & Woolson Machine Co.
Schwartz, L. H. A., & Co.

Netting Machines.
Spindler, E. O.

Noils (Silk).
Ryle, Wm., & Co.

Non-fluid Oils.
N. Y. & N. J. Lubricant Co.

Numbering Machines.
Beck, Charles, Co.

Oil Cups.
Lunkenheimer Co.

Oils.
Borne, Scrymser Co.
Harding & Fancourt, Inc.
Kellogg & Co., E. H.
N. Y. & N. J. Lubricant Co.

Oil Engines.
De La Vergne Machine Co.
Vilter Mfg. Co.

Oil Stencil and Press Board Paper.
Bradley, A. J.

Oiling Systems.
Lunkenheimer Co.

Overseaming Machines.
Merrow Machine Co.
Spindler, E. O.

Packings (Leather).
Graton & Knight Mfg. Co.

Packings (Metallic).
Power Specialty Co.

Paints.
Briggs, John, & Company.
Glidden Varnish Co.
U. S. Gutta Percha Paint Co.
Wadsworth, Howland & Co.

Pantagraphs for Mill Engraving.
Johnson, C. A., & Co.

Paper.
Beck, Charles, Co.
Lane, A. A.
Merwin Paper Co.
Richardson Bros.

Paper Boards.
Merwin Paper Co.

Paper Cones and Tubes.
American Textile Specialty Machinery Co.
Fairpoint Corporation.

Patent and Trade Mark Solicitors.
Calmore & Co.
Coleman, W. E.
Heard, Smith & Tennant.
Howson & Howson.
Munn & Co.
Van Sant, Frank .

Penstocks.
Graver Tank Works, Wm.
Hunt, Rodney, Machine Co.
Stearns Lumber Co., A. T.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Pickers, Leather.
Garland Mfg. Co.

Pinking Machines.
Oswego Machine Works.

Pipes and Fittings.
Scaife, W. B., & Sons.

Plush Machinery.
Buhlmann, A. W.

Pneumatic Conveying.
——See Ventilating.

Portable Elevators.
Economy Engineering Co.
N. Y. Revolving Portable Elevator Co.

Power Transmission Machinery.
Allis-Chalmers Mfg. Co.
American Pulley Co.
American Tool & Machine Co.
Brown, A. & F., Co.
Brown Spin-Wright Cotton Co.
Cresson-Morris Co.
Dodge Mfg. Co.
Evans, G. Frank.
Field & Co., Inc.
Hess-Bright Mfg. Co.
Hunt, Rodney, Machine Co.
Hunter, James, Machine Co.
Kilburn, Lincoln & Co.
Kinkead Mfg. Co.
Leffel, James, & Co.
Morse Chain Co.
New Departure Mfg. Co.
Peerless V Belt Co.
Perkins, B. F., & Son, Inc.
Reeves Pulley Co.
Saginaw Manufacturing Co.
Schofield, William, & Co.
Sellers, William, & Co.
S. K. F. Ball Bearing Co.
Smith, S. Morgan Co.
Standard Roller Bearing Co.
Textile-Finishing Machinery Co.
Tolhurst Machine Works.

Preparatory Machinery (Cotton).
Firth, William, Co.
H. & B. American Machine Co.
Leigh & Butler.
Potter & Johnston Mch. Co.
Riley, C. E., Company.
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Boomer & Boschert Press Co.
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Phila. Drying Machinery Co.
Reliance Machine Works.
Spence & Rideout.
Textile-Finishing Machinery Co.
U. S. Hoffman Co.
Woonsocket Machine & Press Co.

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Beck, Charles, Co.
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Merwin Paper Co.
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Richardson Brothers (Importers and Dealers).

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Production Engineers and Accountants.
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Pulley Covering.
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Blake-Knowles Steam Pump Works.
Dean Bros. Steam Pump Works.
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Worthington, Henry R.

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American Water Softener Co.
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Graver Tank Works, Wm.
Hungerford & Terry.
Leiman Bros.
Norwood Engineering Co.
Scaife, W. B., & Sons.

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Payne, G. W., & Co.
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Schofield, Wm., Co.
Smith & Furbush Machine Co.

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Cling-Surface Co.
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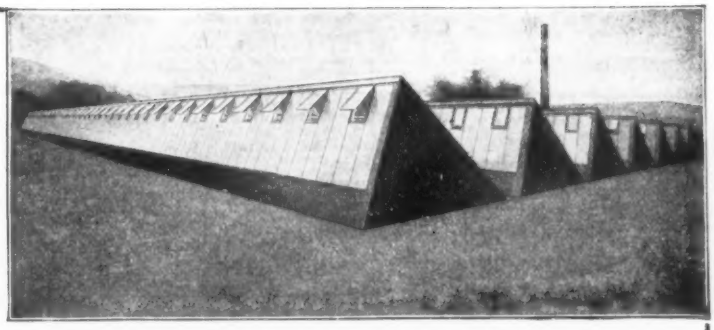

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Sash Operators.
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American Kron Scale Co.
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Merrow Machine Co.
Schappe (French Spun).
Suter, Alfred.
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International Correspondence Schools.
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.
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American Tool & Machine Co.
Sewing Machines and Supplies.
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G TRADE MARK

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SACO, MAINE

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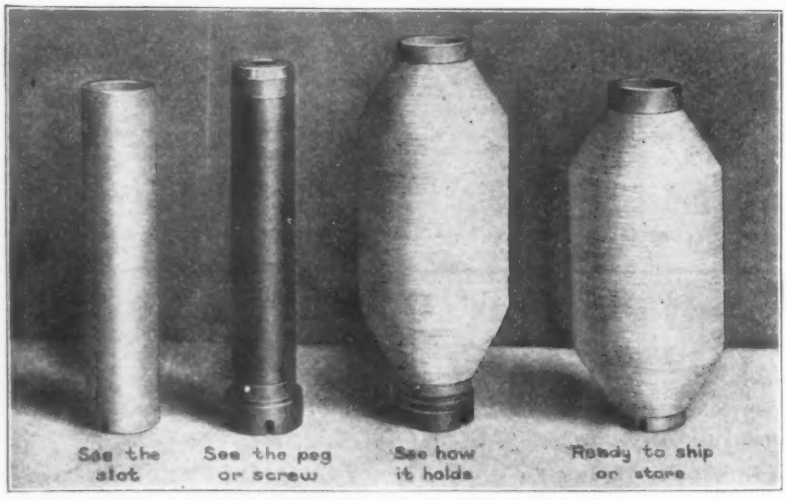
You Can Now Ship and Store on Paper Roving Tubes



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Publisher's Page

Declaration of Principles by the Business Press of America

The Federation of Trade Press Associations in the United States in Eighth Annual Convention assembled at the Hotel Astor, New York, September the 19th, 1913, makes the following declaration of principles:

1. We believe the basic principle on which every trade paper should build is Service—service to readers and service to advertisers, in a way to promote the welfare of the general public.

2. We believe in Truth as applied to the editorial, news and advertising columns.

3. We believe in the utmost frankness regarding circulation.

4. We believe the highest efficiency of the Business Press of America can be secured through Circulation of Quality rather than of Quantity—that character, and not more numbers, should be the criterion by which the value of a publication should be judged.

5. We believe in Co-operation with all those movements in the advertising, printing, publishing and merchandising fields which make for business and social betterment.

6. We believe that the best interests of manufacturers, the Business Press and consumers can be advanced through a greater interchange of facts regarding merchandise and merchandising and to this end invite co-operation by manufacturers and consumers.

7. We believe that the logical medium to carry the message of the manufacturer directly to the distributor and the user is the Business Press.

8. We believe that while many advertising campaigns may profitably employ newspapers, magazines, outdoor display, etc., no well rounded campaign seeking to interest the consumer or user is complete without the Business Press.

9. We believe in cooperating with all interests which are engaged in creative advertising work.

10. We believe that business papers can best serve their trades, industries or professions by being leaders of thought; by keeping their editorial columns independent of the counting room, unbiased and unafraid; by keeping their news columns free from paid reading notices and puffery of all kinds; by refusing to print any advertisement which is misleading or which does not measure up to the highest standards of business integrity.

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Note: The Federation of Trade Press Associations is made up of 241 of the leading business papers of the United States.

Over 75 different trades, industries and professions are represented by the Federation papers.

The capital invested in trade papers in this country has been estimated at not less than $50,000,000. The Federation papers represent a capital investment of not less than $35,000,000.

The number of employes on the Federation papers is about 5,900; the estimated yearly expense for labor is $12,272,000; and, aside from labor, the estimated gross annual expenditures for rent, materials and general expense are $15,000,000.

This declaration of principles was unanimously adopted by the Federation. As Mr. Lord of the Textile World Record was one of the committee of three appointed to draft the declarations it is hardly necessary to state that the declaration in its entirety has the hearty indorsement of the Textile World Record and the Lord & Nagle Company.

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Monthly Circulation Statement

Of this edition 6,350 copies are printed and all are needed.

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MILL NEWS

George Walker, a pioneer knit goods manufacturer of Needham, Mass., died at his home in Needham Heights, Mass., September 13 after two days' illnness of paralysis. Mr. Walker underwent an operation several months ago and although he returned to work he has been in poor health since. He was born in Nottingham, Eng., Dec. 1, 1850. Several years ago he started in the knit goods business in Needham and gave up the manufacturing business a few years ago. He has since been in the employ of a surgical knit goods concern.

Edward L. Anthony, treasurer of the Border City Manufacturing Co., and the Merchant Mill, Fall River, Mass., died September 12 at the Highland Hospital in that city after an illness of a few days. He underwent an operation from which he failed to rally. Mr. Anthony was one of the successful manufacturers of Fall River. He was 56 years of age, and was born in that city, being the son of the late James M. Anthony. A widow and one son survive him.

F. C. Yorks, treasurer and general manager of the Bloomsburg Silk Mill, Bloomsburg, Pa., died at his home in that city at the age of 55 years after a short illness.

John W. Pitkin, for many years treasurer of the Pitkin Holdsworth Worsted Co., Passaic, N. J., died September 20 of acute indigestion at his home in Englewood, N. J., at the age of 72 years. He organized the Passaic Worsted Co., now known as the Pitkin Holdsworth Worsted Co. and was active in business until his last illness. Two sons survive him.

James Dinigan has accepted the position of second hand of the finishing department at the Huntington Manufacturing Co., Huntington, Mass. He was formerly in charge of the dry finishing at the Peace Dale Manufacturing Co., Peace Dale, R. I.

Fritz Stolzenberg, superintendent of Sidney, Blumenthal & Co., Inc., Shelton, Conn., was tendered a banquet September 6 at New Haven, Conn., upon his return from Europe, by members of the executive and engineering forces of that company. P. L. Gerety, who acted as toastmaster, welcomed the guest of honor in a very appropriate way and presented Mr. Stolzenberg with a Turkish brown leather chair, in behalf of the heads of the various departments of Sidney Blumenthal & Company's plant.

W. P. Young, superintendent of the Blackstone Stocking Co., Central Falls, R. I., has severed his connection with that company.

Charles E. Farrington, one of the oldest overseers employed at the Hamilton Manufacturing Co., Lowell, Mass., who had charge of the dressing department at that plant, has severed his connection with that company. He was presented with a purse of gold by the help employed in his department.

J. D. Fowler, overseer of slashing at the Kansas City Cotton Mill, Kansas City, Kans., has resigned.

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Industrial Dept. Heaton's Agency, Toronto

Wanted
Foreman in Bleaching Depa tment

Must be thoroughly conversant with peroxide of sodium bleaching and the handling of fine worsted yarns. Address "Bleaching Foreman," Textile World Record, Boston, Mass.

ASSISTANT SUPERINTENDENT WANTED

In large Woolen Mill. Applicant must be an intelligent young man with a thorough knowledge of the Textile Industry from Wool Sorting to finished product. Preference given to college graduate conversant with cost systems. Address "W. & W.," Textlle World Record, Boston, Mass.

GOOD OPPORTUNITY

for right man with business ability to engage in knitting mill business, making a specialty of underwear. Only nominal capital required. Address with references G. P. C., c\o Textile World Record, Boston, Mass.

Wanted

A Foreman in Spun Silk Mill for boiling off or discharging silk waste. Must be experienced in this work. Address "SPUN SILK," Textile World Record, Boston, Mass.

For Sale—Cotton Mill

The plant of the Hawkinsville Cotton Mills is offered for sale by the bondholders who hold the property.

Property consists of one two-story brick mill house with tower, built on plan providing for enlargement, full equipment of machinery for making yarn and sheeting. (Steam Mill), three thousand spindles, sprinkler system fire protection, one six-room superintendent's dwelling, fourteen four room frame dwellings. Real Estate consists of about nine acres in the thriving town of Hawkinsville close to business center. Mill is reached by side tracks of three railroads and its on navigable river. Mill built in 1900 and plant cost $100,000.00, can be bought for less than half that amount. Write for complete description of property and list of machinery; booklet of town of Hawkinsville showing photo of mill also furnished. Call on or address

E. J. HENRY
Trustee for Bondholders
HAWKINSVILLE, GA.

For Sale

1 Crompton & Knowles Loom, 30" Jacquard & Dobby
1 " " " 40" " "

Both as good as new and are in the best of condition. Address "Loom," Textile World Record, 120 Liberty Street, New York.

WANTED

Man to take charge of and fix 7/8 automatic Scott & Williams machines making infants' stockings, made from 2/40 worsted yarns, with silk heel and toe; 15 ribbers, sizes, 3 1/4 to 3 3/4 inch; 25 footers, which are from 2 1/4 to 2 3/4. Address "Fixer," Textile World Record, Boston, Mass.

Cotton Yarn Salesman

Having extensive experience and a thorough knowledge of the yarn business is open for an engagement on a commission basis to represent a good cotton yarn spinning plant in State of Pennsylvania. Address, W. H. ERMENTROUT, 209 N. 6th St., Reading, Pa.

The Logical Place

for Advertisements of

Second-Hand Machinery

The Textile World Record carries more advertising of textile machinery, equipment, and supplies than any other textile periodical. Very many of its 400 advertisers use no other.

The reason for its continued success as an advertising medium for the sale of textile machinery is that its subscribers buy about **$250,000,000 worth of textile machinery,** equipment, and supplies (not including raw material) each year.

Being so successful for new machinery it should also prove profitable for the advertising of second-hand machinery, and for the sale of anything of special interest to men in the mill who are held responsible for results, e. g., mills, power-plant equipment, supplies, etc.

Therefore, if you have any textile machinery, mill or power-plant equipment that you do not intend to use again, the Textile World Record offers you the best market for its disposal at a fair price. For further information address:

Classified Advertising Department

TEXTILE WORLD RECORD

144 Congress Street Boston, Mass.

Wanted Second Hand Machinery

One calender for finishing crash towelling; one bobbin winder with swifts; one beaming frame—automatic looms. Must be in good condition and cheap. State condition of machinery. "S. M.," care Textile World Record, Boston.

Cost Accountant and Office Manager.

Up to date on organization and efficiency methods, desires position in a large Textile Mill, where results will be appreciated, 14 years with present employer. If interested address "Efficient," Textile World Record, Boston, Mass.

MANUFACTURERS OF COTTON

Jute or Hemp Twines, Sheeting or Duck, wishing sales agent in the Chicago and Milwaukee market. Please correspond with "Cotton Sales Agent," Textile World Record, Boston, Mass.

Salesman Wanted

To sell high grade gums to the textile trade. Must be experienced. State experience and salary. Address "Salesman," Textile World Record, Boston, Mass.

Mechanical Engineer

Having 15 years practical experience in the Design, Construction and Maintenance of Textile Machinery, desires responsible mill position. A-1 references. Address "Mechanical Engineer," Textile World Record, Boston, Mass.

Situation Wanted

As Manager or Superintendent of Cloth Finishing Plant by an energetic, active man, 37 years of age, exceptional executive ability. Ten years experience in silk cloth finishing works. Seven years as superintendent of the largest silk finishing plant in America. Will go anywhere. Reasonable salary will be considered. Excellent testimonials. Address M. L. Urban, 481 E 140th Street, New York City.

Which firm, especially of the textile industry, in connec. with their present works or independently, is interested in the manufacture of

ARTIFICIAL LEATHER

by the newest process far cheaper than any competition? Expert with long practical experience wishes installation and management of same and can partly finance the undertaking if necessary. Only to sincere inquirers will full details be given. Address "Waterproof Textiles," care Textile World Record, Boston.

SALESMAN WANTED

First class man to represent a large concern manufacturing wool shoddy and extracts. Only man familiar with shoddy business and traveling will be considered.

Address "Shoddy," Textile World Record, Boston, Mass.

Wanted: Manager for Knitting Mill

Must Invest $10,000

A modern up-to-date, progressive, successful knitting mill in N. Y. State wants a man to take complete control of the manufacturing end. Must be thoroughly familiar with all processes and departments of manufacture and have a thorough knowledge of knitting machinery and be a good manager of help. This mill is doing a successful business, has A1 credit and the market for its product is secure. Can manufacture and sell $500,000 per year. A good man is wanted and a good salary will be paid.

A man for the position must invest $10,000 which will be amply secured and protected in every possible way, so that in case of liquidation the principals would lose and not this new investor. Investment is not needed, it is only desired to insure the interest of the manager. The proposition will stand and invites the most rigid investigation. For full particulars and arrangement of interview address "Knitting Mill Expert," Textile World Record, Boston.

Situations Wanted

Manufacturers who are in need of Superintendents or Overseers for any department of mill work may learn of suitable men upon application by mail or telephone to C. T. DONLEVY, care Textile World Record, 144 Congress Street, Boston., who will give prompt attention to their requirements without charge.

Overseer of Weaving or second hand in cotton mill, or would accept position of assistant superintendent; has worked on cotton damasks, corduroy, crochet, marseilles and satin quilts; towels (cotton, crash or pile), fancy dress goods, shirtings, narrow fabrics, both silk and cotton, bagging and duck; familiar with Crompton & Knowles, Draper, Stafford, Whitin, Mason, Wood and others; 26 years of age, married; good reference.
6025, Textile World Record, Boston, Mass.

Woolen or Worsted Designer, superintendent, or designer and superintendent; has worked on men's wear in woolens and worsteds, also all classes of ladies' dress goods; familiar with Crompton & Knowles, Hattersley, jacquard and all makes in fast looms; has had 17 years' experience as head designer; 37 years of age, married; good reference.
6011, Textile World Record, Boston, Mass.

Designer in Worsted Mill; has worked on all kinds of woolen and worsted fabrics; familiar with all kinds of woolen and worsted cloth machinery; 21 years of age; good reference.
6010, Textile World Record, Boston, Mass.

Overseer of Cotton Carding, cotton sampler or boss picker; is familiar with all kinds of cotton carding machinery; 29 years of age, married; prefers Rhode Island; good reference.
6023, Textile World Record, Boston, Mass.

Superintendent or designer of woolen mill; has worked on high and low grade woolens, fancy worsteds, piece dyes, manipulated cloths and union dyes; 34 years of age, married; good reference.
6024, Textile World Record, Boston, Mass.

Overseer of Dyeing in woolen mill; has worked on raw stock, worsted yarns, piece dyes, woolens, worsteds and union piece dyes; familiar with all makes of dyeing machinery; 30 years of age, married; will not go South; good reference.
6026, Textile World Record, Boston, Mass.

Overseer of Carding on wool, cotton waste of all kinds or shoddy; has worked on sail yarn on cotton and wool, dress goods, suitings, and knitting yarns of all kinds; familiar with all makes of cards; 40 years of age, married; will not go South; good reference.
6009, Textile World Record, Boston, Mass.

Assistant Designer in woolen mill; has worked on gents' vests, overcoatings, suitings, woolen goods, ladies' dress goods, worsted goods and men's wear; familiar with the Knowles, Crompton, Thayer and English looms; 22 years of age; will not go West, South or to Canada; good reference.
6008, Textile World Record, Boston, Mass.

Overseer of Dyeing in woolen mill; has worked on woolen and worsted suitings, half woolens, wool and shoddy mixes; prefers low grade stock; familiar with the Klauder-Weldon machines; 24 years of age; will not go to Mass., Conn., Me., N. H., Vt., N. J., or to Canada; good reference.
6007, Textile World Record, Boston, Mass.

Overseer of Spinning, twisting, reeling, winding and warping in worsted mill; has worked on English mohair, botany, alpaca, cap, fly and ring spinning; also twisting; tubes, filling and double headed spools; familiar with all makes of worsted machinery; 37 years of age, married; will not go to Me., N. J., West or to Canada; good reference.
5974, Textile World Record, Boston, Mass.

Designer of artistic and original designs for textile and printed fabrics; has worked on cotton, wool and silk embroidery; 42 years of age; good reference.
5975, Textile World Record, Boston, Mass

Fixer in Hosiery Mill; has worked on cotton and mercerized hosiery; familiar with George D. Mayo and Invincible knitters; Beattie, Hepworth and German loopers, also Merrow welters; 35 years of age; good reference.
5976, Textile World Record, Boston, Mass.

Overseer of Carding in woolen or worsted mill, or carding and spinning; would also consider position of superintendent of woolen mill or felt mill; 51 years of age, married; has worked on all kinds of goods and familiar with all makes of machinery; good reference.
5977, Textile World Record, Boston, Mass.

Designer, assistant superintendent or overseer of weaving in woolen mill; has worked on woolens and worsteds for men's and ladies' wear, overcoatings and dress goods; worsted counts of yarns from 2/20s to 2/60s; familiar with Crompton & Knowles, jacquard looms, etc., Universal winding machines, also finishing machinery; 25 years of age; good reference.
5978, Textile World Record, Boston, Mass.

Overseer of worsted yarn department; would accept position of overseer of spinning; has worked on fine botany and carpets; familiar with Prince, Smith, Hall & Stell, Farrar, Boyd, Collins, etc.; 34 years of age, married; good reference.
5979, Textile World Record, Boston, Mass.

Superintendent of cotton mill or would accept good boss carding position; has worked on about everything made from yarns between 8s to 150s; familiar with all makes of machinery; 39 years of age, married; good reference.
5980, Textile World Record, Boston, Mass.

Designer in Cotton Mill or will consider any position where there is a chance for advancement; has worked on fine goods and fancies; familiar with Potter & Johnson cards and pickers; Kitson pickers; Howard & Bullough cards and spinning frames; Whitin & Nasmith combers; Howard & Bullough and Woonsocket speeders; Fales & Jenks spinning and twisting machines; Draper, Stafford, Whitin, Mason, Crompton & Knowles, Gem pick and pick, also jacquard machines; good reference.
5981, Textile World Record, Boston, Mass.

Overseer of Carding and spinning in woolen mill; has worked on all kinds of goods; 31 years of age, married; will not go West, South or to Canada; good reference.
5970, Textile World Record, Boston, Mass.

Overseer of twisting, warping, spooling, winding, slashing and quilling in cotton mill; has worked on sewing thread, hosiery yarn, tire fabrics, all kinds of cotton yarns from Nos. 1 to 190, from 2 up to 20 ply; familiar with Fales & Jenks, Howard & Bullough, Whitin and Lowell machines; 31 years of age, married; will go to Mass., R. I., and Conn.; good reference.
5982, Textile World Record, Boston, Mass

Overseer of Weaving in woolen mill; has worked on flannels, cassimeres, dress goods, worsteds and blankets; familiar with Crompton & Knowles and Crompton & Thayer looms; 36 years of age, married; good reference.
5985, Textile World Record, Boston, Mass.

Overseer of dyeing, dyeing and finishing or finishing of mohair linings; has worked on yarns, raw stock, piece dyes, knit goods, hosiery, woolen and cotton goods; familiar with all kinds of machinery; 49 years of age, married; good reference.
5986, Textile World Record, Boston, Mass.

Designer or assistant designer in woolen mill; has worked on men's wear, woolens and worsteds, cheviots, saxonies, overcoatings, vestings and checkbacks; 29 years of age; good reference.
5987, Textile World Record, Boston, Mass.

Overseer of Dyeing in woolen mill; has worked on face finished uniform cloth, indigo stock dyeing, fancy shades on wool, worsted and piece dyes, astrachans and unions; familiar with yarn machines, scouring, stock drying, and piece dyeing machines of standard makes; 32 years of age, married; good reference; will not go to Canada.
6000, Textile World Record, Boston, Mass.

Second Hand in woolen card room; has worked on flannels, dress goods, broadcloths and fancy woolens; familiar with Barker and Davis & Furber cards; 22 years of age; good reference; prefers Me. or Mass.
6001, Textile World Record, Boston, Mass.

Chemist or would consider position in bleachery; has had experience with soaps, oils and mill materials; familiar with all classes of dyestuffs, etc.; has worked on all kinds of machinery connected with bleaching and finishing of cotton piece goods; 25 years of age; good reference.
6002, Textile World Record, Boston, Mass.

Assistant Designer in woolen mill, or assistant superintendent in small mill; has worked on cassimeres, whip cords, coverts, overcoatings, plaid backs, etc.; familiar with Knowles looms; 20 years of age; will not go West, South or to Canada; good reference.
6014, Textile World Record, Boston, Mass.

Overseer of spinning, winding, twisting, warping or spooling in cotton mill, assistant superintendent or manager; has worked on all kinds of cotton, linen and silk goods, also thread; familiar with all makes of spinning, twisting, winding, warping and spooling machinery; 40 years of age, married; will not go to Mass.; prefers good Southern mill; good reference.
6016, Textile World Record, Boston, Mass.

Overseer of Dry Finishing or second hand in woolen mill; has worked on worsteds and woolens; familiar with all kinds of finishing machinery; 32 years of age, married; will not go to Me., N. H., Vt., Pa., N. J., West, South or to Canada; good reference.
6015, Textile World Record, Boston, Mass.

Manager or Superintendent of underwear mill; has worked on all kinds of goods; familiar with all kinds of machinery; understands the knitting business thoroughly in every stage; 45 years of age, married; will not go to Canada; good reference.
6017, Textile World Record, Boston, Mass.

Overseer of Weaving in cotton mill; has worked on cross and fine cottons; lenos, silk shirtings and worsted dress goods; familiar with most all makes of machinery, plain, fancy, also jacquards; 46 years of age, married; will not go West or South; good reference.
6018, Textile World Record, Boston, Mass.

Assistant Designer and assistant superintendent or designer in small woolen mill; has worked on fancy worsteds and woolen men's wear; 24 years of age, married; will not go West, South or to Canada; good reference.
6019, Textile World Record, Boston, Mass.

Superintendent of Worsted Yarn Mill, or would accept position as overseer of drawing, spinning or twisting; has worked on all qualities of yarn from low common to fine Australian wools; familiar with Lowell Machine Shop, Prince, Smith & Son and Hall & Stell makes of machinery; 27 years of age; good reference.
6020, Textile World Record, Boston, Mass.

Designer in Woolen Mill or assistant superintendent in small mill; has worked on fancy woolens and worsteds, overcoatings, kerseys, flannels, dress goods, thibets, cotton carded goods, etc.; familiar with mules, cards, pickers, looms, and woolen finishing machinery; 26 years of age; will not go West or South; good reference.
6021, Textile World Record, Boston, Mass.

Overseer of Ring Spinning in cotton mill, or general second hand of spinning in a large plant; has worked on all sizes of yarns made from Sea Island, Egyptian and Peruvian cotton; familiar with Fales & Jenks, Whitin, Saco, Pettee, Howard & Bullough and Mason machines; 38 years of age, married; good reference.
6022, Textile World Record, Boston, Mass.

Overseer of Carding in woolen mill; has worked on cassimeres, jeans and a general run of fancies from 5 to 20 cut; familiar with Davis & Furber, Furbush, James Smith and other machines; 26 years of age, married; will consider Western or Southern States; good reference.
6006, Textile World Record, Boston, Mass.

Superintendent or assistant of cotton mill; has worked on all kinds of linen goods and a large variety of cottons; thoroughly up in jacquard work also; familiar with English machines and understands Crompton & Knowles looms; 47 years of age, married; good reference.
6005, Textile World Record, Boston, Mass.

Overseer of Weaving in woolen mill; has worked on worsteds, meltons, kerseys, cotton worsteds, cloakings, overcoatings, chinchillas, ladies' dress goods and suitings; familiar with Knowles and Crompton looms; will not go to Pa., West, South or to Canada; 50 years of age, married; good reference.
6004, Textile World Record, Boston, Mass.

Assistant Designer or assistant superintendent in woolen or worsted mill; has worked on all kinds of woolen and worsted fabrics; familiar with all makes of machinery; 35 years of age, married; will not go South; good reference.
6003, Textile World Record, Boston, Mass.

Overseer of Burling and Mending or assistant designer in woolen mill; has worked on ladies' dress goods, plain and fancy worsteds; 31 years of age, married; will not go to Vt., Pa., N. J., West, South or to Canada; good reference.
6013, Textile World Record, Boston, Mass.

Overseer of Dyeing in woolen mill; has worked on all kinds of shoddy and worsted mixed dyes, raw cotton and cotton yarn; familiar with all the latest makes of machinery; will not go West, South or to Canada; 43 years of age, married; good reference.
6012, Textile World Record, Boston, Mass.

Sewing Machine Fixer, or would accept position as machinist on flat knitting machines; familiar with silk, cotton, wool underwear; also cotton wool and worsted sweaters; familiar with all makes of sewing machines; Lamb, Grosser and Dubied flat knitting machines; 26 years of age; will not go to Canada; good reference.
5995, Textile World Record, Boston, Mass.

Chemist and Overseer of Dyeing of woolen yarns; has worked on woolen yarns for oriental and other carpets; 45 years of age; good reference; will go anywhere for a good position.
5994, Textile World Record, Boston, Mass.

Overseer of Burling and Sewing in woolen or worsted mill; has worked on all kinds of woolens and worsteds; 29 years of age, married; good reference.
5996, Textile World Record, Boston, Mass.

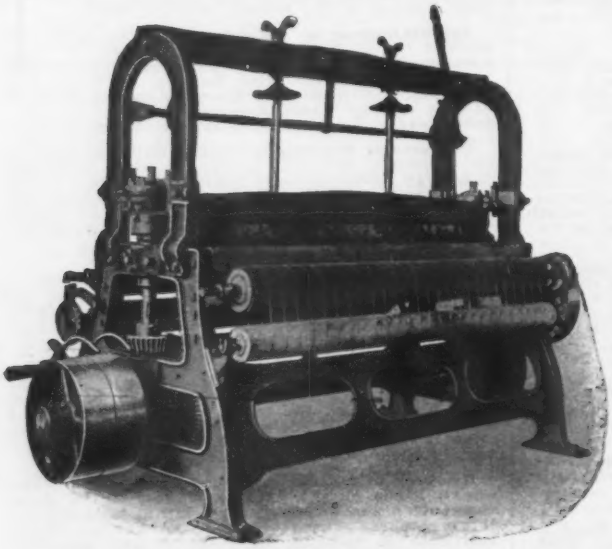
Designer or designer and assistant superintendent in woolen or worsted mill; has worked on medium and fine fancy worsteds and piece dyes, cotton worsteds, both fancy and piece dyes and woolens; has had some experience on all kinds of pile goods; familiar with Crompton, Knowles and jacquard looms; 43 years of age, married; will not go West, South or to Canada; good reference.
5997, Textile World Record, Boston, Mass.

Manager or assistant manager in cotton mill; has worked on cotton battings, felts, cocoa and African palme fibers, roving and cone yarns, also novelty yarns, etc.; familiar with Smith & Furbush garnetts, pickers, etc., Whitin, Kitson, Saco, Pettee and Lowell machines, also Crompton & Knowles looms; 42 years of age, married; good reference.
5998, Textile World Record, Boston, Mass.

Overseer of Dyeing in woolen mill; has worked on woolens, worsteds, skein, piece and resist dyes, silk decorations, etc.; familiar with all makes of machinery; 43 years of age, married; will not go South or to Canada; good reference.
5999, Textile World Record, Boston, Mass.

Superintendent of cotton mill or designer on cotton goods is open for engagement; has good references from mills where last employed.
5993, Textile World Record, Boston, Mass.

CHINCHILLA MACHINE



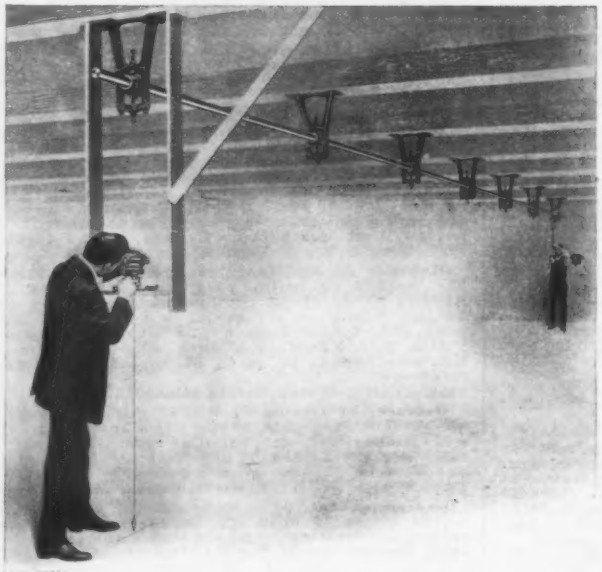
ALSO MANUFACTURERS OF
Tentering and Drying Machines, Crabbing Machines, Cloth Washers, Whipping Machines, Etc.

For producing
the following finishes:

Chinchilla
Petersham
Ratine
Crepe and
Whitneys

Manufactured by
D. R. Kenyon & Son
Raritan, N. J.

The "Kinkead Apparatus" Can Improve Conditions In Your Plant.



First. It enables you to align and level any shaft, of any length, of any size or of many sizes, irrespective of the location of the line, or of obstructions under or around it, with **absolute accuracy.**

Second. It enables you to align your shafting **quickly and often.**

Third. It enables you to align your shafting without removing a single belt or pulley.

Fourth. It enables you to align your shafting during any hour of the twenty-four without lighting up your whole plant.

Send 6 cents in stamps for our 55-page book of instructions with illustrations on "Alignment of Shafting and Machinery."

Kinkead Mfg. Co.
7 Water Street, Boston, Mass.

MILL NEWS

*New York, Cohoes. It has been decided to make an offer of 25 cents on the dollar to creditors of Clute Bros., Inc., manufacturers of cotton batting. If this is accepted it will be possible for the concern to continue business without disruption.

New York, Gouverneur. The Chamber of Commerce is negotiating with representatives of a silk manufacturing concern who will come here shortly to get in touch with conditions.

*New York. Haverstraw. It cannot be learned definitely whether the Home Silk Mills will remove from Haverstraw. The men who control this mill have started a new mill at Cortland, N. Y., under the name of the Tioughnioga Silk Company and it is rumored the plant is to be moved to Cortland.

New York, Hornell. An increase has been made in the capital stock of the Merrill Silk Company from $300,000 to $1,000,000. The capital of the Merrill Hosiery Company also has been increased from $150,000 to $500,000. F. P. Merrill is treasurer of both concerns.

New York, Newburgh. The Palatine Silk Company has been incorporated with capital stock of $10,000 to make silk goods. The incorporators are John Deisseroth, Gustave Heidle and Fred W. Fulda, of Newburgh. It is understood the new corporation takes over the Palatine Silk Company, operated by Messrs. Heidle, Fulda and Deisseroth on broad and lining silks, operating 20 looms.

New York, New York City. George W. Robinson, City Island, proposes to build a small two-story mill, about 50 by 100 feet, to be equipped for weaving cotton duck, the equipment to include 10 looms and yarn preparatory machinery.

New York, New York City. H. T. Clark, 99 Franklin St., N. Y., representative of the Continental Finishing Company, River Point, R. I., which has shut down pending a readjustment of the affairs of M. N. Berlin & Co., N. Y. converters, is reported to be negotiating for the purchase of a plant near Providence. Mr. Clark proposes to finish the class of goods handled by the Continental Finishing Company.

New York, New York City. The P. J. Good Rug Company, recently incorporated, are selling agents with offices at 17 Madison Ave.

New York, New York City. L. B. Samilow Company, Inc., has been organized with capital stock of $20,000 to manufacture silk and cotton goods. The incorporators are Lester B. and Adele R. Samilow, 540 W. 165th St., New York, and Gustave H. Reiss, Brooklyn. Mr. Samilow is quoted as saying that this is a new business which will begin operations about September 15 at 229 4th Ave.

New York, New York City. A charter has been granted Lincrusta Works Pallas, Inc., with capital stock of $100,000 to import and deal in paper textiles. The incorporators are August C. Stifel, 150 Maiden Lane; Henry Cohen and D. Walter Griffith, 35 Nassau St., New York.

Why Did the American Felt Co.—

adopt the Kaumagraph Process? This company recently decided to trademark a certain product in high favor with manufacturers because of its unusual merit. An inexpensive process was needed which would produce a uniformly handsome mark in keeping with the character of the product; a permanent mark to survive handling;—a process both rapid and adapted to unskilled labor. The need was met by the Kaumagraph Process.

KAUMAGRAPH PROCESS

OF TRADE MARK STAMPING FOR ALL TEXTILES

The Kaumagraph Process is the only process that will mark successfully every kind of fabric—dark or light, rough or smooth, ribbed or plain, from silk to blankets. It stamps any design or trade-mark, however elaborate, on any fabric in any color (silver and gold also) with absolute uniformity and perfect detail.

You buy Kaumagraph stamps ***ready for use,*** either in packages or in rolls of thin paper tape. They are applied automatically to goods during some process of manufacture, or very rapidly by hand with unskilled labor. Their cost is insignificant, especially in large quantities.

Silver and gold stamping costs no more than colors by the Kaumagraph Process. It is much more rapid than any of the decalcomanie processes because Kaumagraph stamps do not need to be cut apart or wet. Kaumagraph impressions are dry, do not blur or offset, and as the composition tends to penetrate the goods instead of remaining on the surface, the Kaumagraph stamp is more permanent than any other on the market.

The Kaumagraph Process is used on practically all fabrics now being advertised. Manufacturers, who are considering trade-marking their goods or adopting more efficient and economical methods of trade-marking are urged to write us frankly without thought of obligation. Meanwhile use the coupon now.

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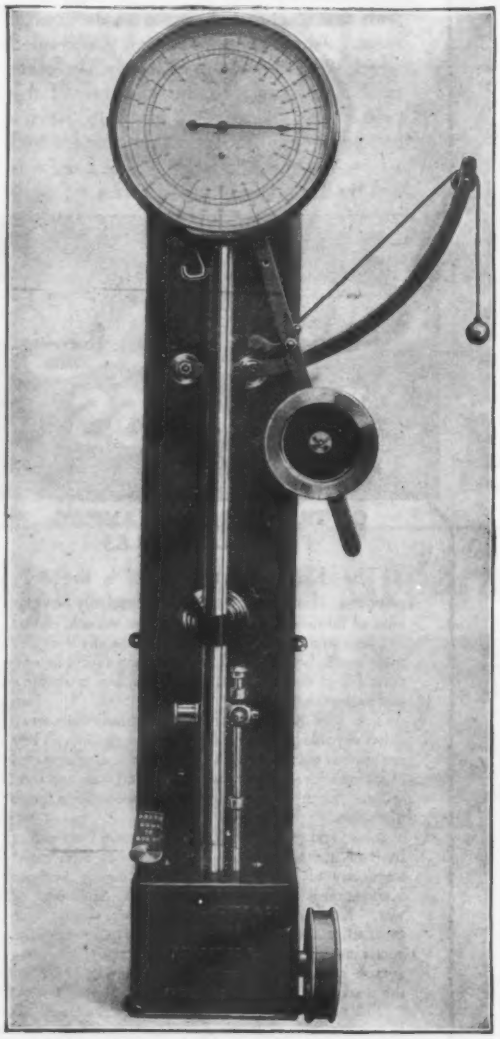
Kaumagraph Co., 209 W. 38th St., New York
Send me samples and more information
My name, address and firm name are written below

SCOTT TESTERS

Used by the U. S. Quartermasters' Department and by the U. S. Bureau of Cotton Standardization.



Scott Automatic Power Yarn Tester, Patented

What some of our other customers think of the

SCOTT AUTOMATIC POWER YARN TESTER

"It is giving excellent satisfaction, and we have found it accurate and dependable." — *Dudley Mills Co., Worcester, Mass.*

"It is entirely satisfactory."—*J. R. Keim & Co., Inc., Schackamaxon Mills.*

"We are entirely satisfied, and consider it the best machine for this purpose made in this country." — *American Textilose Co., Newburyport, Mass.*

"We are well satisfied with this machine, and we do not see how it could be improved." — *American Hosiery Co., New Britian, Ct.*

"Are pleased to advise that we have found this tester very satisfactory in every respect." — *Chicago-Kenosha Hosiery Co., Kenosha, Wis.*

"We find it is accurate and can be depended upon, and has come up fully to our expectations."—*Saratoga Victory Mfg. Co., Victory Mills, N. Y.*

"We have had one in constant use for some time on yarn counting from a 2's to a 200's and have found in every instance that it can be relied upon for accuracy and quickness of operation."—*Chas. J. Webb & Co , Philadelphia, Pa.*

We are well equipped to build machinery and appliances on contract

HENRY L. SCOTT & CO.

223-233 EDDY STREET PROVIDENCE, R. I.

MILL NEWS

New York, New York City. The United States Finishing Company has been granted the year's extension asked for some time ago as noted. The various plants are on a money-making basis under the new management and it is believed that arrangements have been perfected whereby the company will be able to work out of its difficulties.

New York, New York City. The Phoenix Asbestos Mfg. Company has been granted a charter with capital stock of $10,000 to manufacture asbestos and steam packing. The incorporators are William R. Barrett, 8 8th Ave., Brooklyn; Mary E. Tryson, and Sidney S. Levine, 55 John St., New York.

New York, New York City. Reports are current stating that a concern known as the Silk Fabrics Company, Inc., has been organized and will manufacture silk fabrics. This concern will do an importing business only.

New York, New York City. The Empire Waste Co., Inc., recently organized as noted, as a selling concern, handling cotton and wool waste for railroad and machinery purposes.

New York, Syracuse. The Syracuse Linen Company, Inc., has been organized with capital stock of $6,000 to manufacture linens. The men interested are George E. Scherer, Michael J. Carroll and Allan R. Cowie.

New York, Theresa. Negotiations are being made by a New Jersey silk manufacturer for the Theresa Silk Mills. The manufacturer interested was here a few days ago looking the proposition over. The mill was shut down in the spring when a receiver was appointed for the Theresa Silk Company and is now in the hands of the bondholders.

Pennsylvania, Blakeslee. Plans are being prepared by G. N. Edson, an architect located in the Connell Bldg., Scranton, for a new silk mill to be built in Blakeslee by D. G. Dery. Mr. Dery operates a number of silk mills. His main office is in the Allentown National Bank Bldg., Allentown, Pa.

*Pennsylvania, Hanover. Plans for the new silk mill to be erected for E. & H. Levy, silk ribbon manufacturers of New York, are being made by W. J. Klink, 486 Carlisle St. A two-story mill, 150 feet long, will be built.

Pennsylvania, Philadelphia. Migel & Blun, operating 150 looms on silk ribbons in Paterson, have leased floor space in the mill at the S. W. corner of Coral and Adams Sts., where it is said they will install equipment for the manufacture of the same line of goods, to be operated as a branch of the factory in Paterson.

*Pennsylvania, Scranton. Changes and improvements in the power department of the Saucuoit Silk Mfg. Company, on which they have been working since last fall, are well on toward completion and they expect in another month to have the entire plant electrified. They will not discard their steam engines but will use them for generating electric power.

Pennsylvania, Slatington. A 2-story brick addition is being built to the local plant of Post & Sheldon Corp. Plants are also operated at Paterson, N. J., and Allentown, Pa.

*Pennsylvania, Warren. Jacob Thissen and P. W. Durkin are the men interested in establishing a silk hosiery and glove industry in Warren. A 2-story brick and steel building, 50 by 130 feet, is now in process of construction and will be erected at a cost of $15,000. John Osborn & Son of Franklin, Pa., have the contract. A company will be formed at an early date probably under the name of the Warren Silk Mfg. Co., incorporated under the laws of Pennsylvania. Mr. Thissen's present address is 121 Fifth Ave., Warren. He is understood to be the same Jacob Thissen who has been president and manager of the Thissen Silk Mfg. Co., at Kane, Pa., which was at one time located at Fonda, N. Y., under the name of the Thissen Silk Fabric Co.

North Carolina, Hickory. It is reported the Ivey Mill Co. will put all its looms on sateens, changing over those that are now weaving twills and silk mixed goods.

*North Carolina, Kannapolis. Good progress is being made on the new mill being erected here by the Cabarrus Cotton Mills of Concord.

*North Carolina, Laurel Hill. Some progress is being made by Ralph Morrison on his 4,000-spindle cotton yarn mill project. Mr. Morrison was formerly superintendent of the three cotton yarn mills in Laurel Hill.

North Carolina, Zebulon. B. H. Richardson of this place is organizing a $100,000 company to build a cotton mill.

Ohio, Steubenville. There is a rumor that a New Jersey silk manufacturing concern is seeking a location in Steubenville for a branch plant.

Oregon, Klamath Falls. The Santiam Woolen Mills of Stayton may be moved to Klamath Falls. A member of the Chamber of Commerce recently visited Stayton to look over the mill and has opened negotiations for its removal to this place. John P. Wilbur, the president and manager, is willing to come to Klamath Falls and if the necessary inducements can be offered the plant will probably be brought here. The Santiam Woolen Mills is a reorganization of the old Stayton Woolen Mills. Mr. Wilbur purchased the plant from creditors of the old company early in 1912 and has since operated the plant, which contains three sets and twelve looms, on blankets, mackinaws, batting and mattresses.

Pennsylvania, Altoona. The transferring of a number of operatives from the throwing department to the weave room in the local plant of the Schwarzenbach, Huber Company has given rise to a rumor that the mill would be partially closed. It is learned that there is absolutely no truth in the report.

Pennsylvania, Bangor. It is reported the Venus Silk Glove Mfg. Company has secured quarters in Brooklyn, N. Y., and that some of the departments will be moved to the new location.

A. W. BUHLMANN

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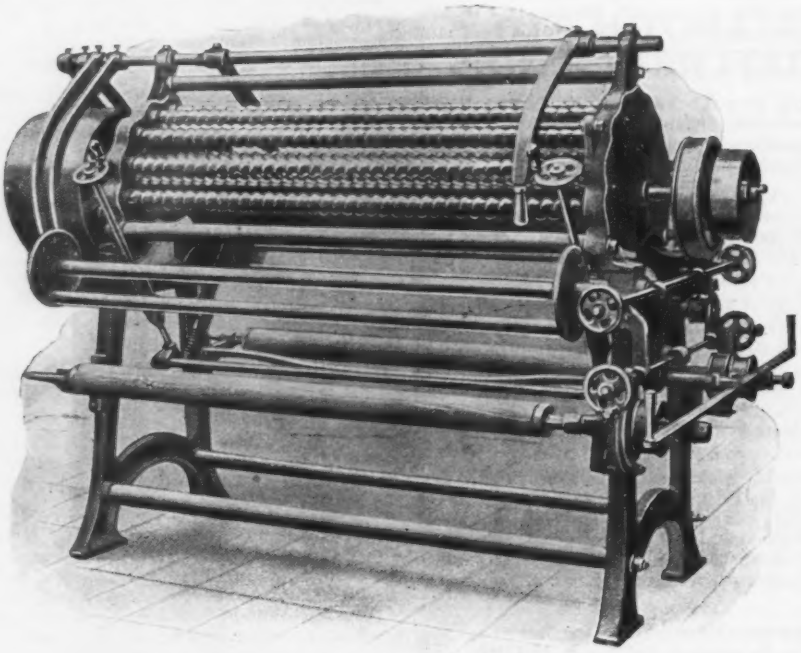

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it will pay to

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MILL NEWS

Pennsylvania, Philadelphia. L. H. Petzoldt, manufacturer of ingrain carpets on 17 looms, whose plant at Howard and Montgomery Ave. was burned out several months ago, his disposed of what machinery was not damaged by the fire and retired from business.

Pennsylvania, Philadelphia. Oscar B. Wagner has succeeded the firm of Ricker & Wagner, operating the Oak Mills at 2633 N. Bodine St., where he is manufacturing rugs, ingrain carpets and art squares on 20 looms.

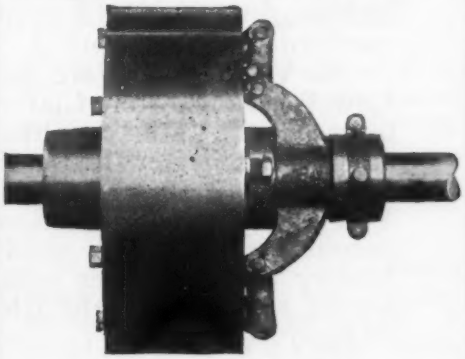
Pennsylvania, Philadelphia. At a meeting of creditors, recently held to look into the affairs of W. A. Gardner, manufacturer of dress goods on 40 looms at Somerset and Boudinot Sts., it was agreed to accept a settlement on a basis of 35 per cent. The plant is now shut down but it is presumed that satisfactory arrangements having been made with creditors it will be started up again.

Pennsylvania, Philadelphia. Carl P. Berger, a local architect, has completed plans and is ready for bids on a two-story brick and concrete dye house, 100 by 200 feet, and a one-story power house, 90 by 90 feet, to be erected on the Delaware River at Milner St. The operation, it is said, will cost in the neighborhood of $100,000. The name of the parties for whom the plant is to be erected has not been given.

Pennsylvania, Philadelphia. Felix Brecher, 927 Lafayette Bldg., representing G. Josephy's Erben Bielitz, Austria, has arranged to leave this country on October 11, on the steamship Imperator, with a number of American textile manufacturers engaged in the spinning of woolen and cotton yarns, cloth weavers, etc., for a visit to different European countries for the purpose of showing them through various mills of all kinds, beginning with the lowest cotton waste and mungo, up to the finest wool and cotton knitting yarns. The main purpose of the visit will be to show the visitors the various lines of "Josephy" machinery, operating on different kinds of stock, and to investigate what advantage there may be for the American manufacturer to operate this line of machinery in this country. In addition to going through these various mills, which will interest American manufacturers, Mr. Brecher will also show the visitors through the large shops of G. Josephy's Erben in Bielitz. This trip no doubt will be of interest and commercial value to those accompanying Mr. Brecher, who we understand will be glad to take several more manufacturers in this party. He expects to be back in Philadelphia about the first of December.

Pennsylvania, Philadelphia. Report has it that William Sellers & Co., Inc., builders of power transmission machinery at 16th and Hamilton Sts., have purchased a track of 47 acres at Folsom Station, in Delaware Co., which they are having graded preparatory to the erection of a number of buildings, work on which will be started at once with a view of having them ready for occupancy within a short time.

THE CLUTCH
WITH THE
STRONG GRIP



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With a ***Friction Clutch Coupling*** the department can at once be again set in full motion, without stopping the engine or interfering with any other department.

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The Power Transmission Specialists
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FOR TEXTILE PLANTS

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G. V. Electrics are used by the mills of Lawrence, Lowell, Manchester, Claremont, Nashua, Biddeford, Fitchburg, North Adams, Waltham, Worcester, Hartford, Phillipsdale, Port Chester, Little Falls, Utica, Oneida, Buffalo, Fort Wayne (Ind.), Brooklyn, Philadelphia and several other cities. You will note that a good variety of operating conditions are encountered, and as wool, cotton, print, underwear, and hosiery mills together with dye houses and bleacheries are served, surely the right Electric will "make good" in about all such work.

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The electric is particularly suited for work around inflammable material, andremember it is sanitary and odorless. The G. V. Electric leads in its field because it was the pioneer and has maintained its lead. Ask about our new improvements and send for catalogue T-89.

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MILL NEWS

Pennsylvania, South Bethlehem. A mill on E. 4th St., known as the Groman Bros. Mill has been secured by D. G. Dery and looms from the Scranton plant of Mr. Dery are being installed.

*Pennsylvania, Walnutport. Manufacturing has been started by the Walnutport Silk Company, weaving broad silks. This is a new concern of which E. T. Zellner is president and H. J. Feldhege, treasurer and manager.

Rhode Island, Harrisville. The Stillwater Worsted Company is running day and night getting out about double the normal production.

Rhode Island, Greenville. The Smithfield Worsted Mills were closed for a few days on account of a break-down. Repairs have been made and the plant has been started up. This concern has been very busy since starting operations a few months ago.

*Rhode Island, Nasonville. The real estate and machinery of the Nasonville Woolen Company has been sold to the National Machinery Company of Providence, representing the bondholders, for the sum of $43,000. The stock, fixtures, etc., were taken mostly by small dealers.

Rhode Island, Providence. Benjamin G. Rae of Fairhaven, Mass., who has been a salesman in the middle west for the New England Cotton Yarn Company, and Charles H. Morton have organized the Eastern Yarn Company with authorized capital stock of $50,000, to establish a yarn selling agency in Providence. Charles H. Morton is president, Benjamin G. Rae, treasurer, and these men with H. M. Rae are the directors. Mr. Morton holds five shares, B. G. Rae, forty shares, and H. M. Rae, five shares.

Rhode Island, Providence. Reports that the Providence plant of the Glendale Elastic Fabrics Company will be moved to the main plant in Easthampton are denied by Wm. Astill, superintendent of the Providence plant, and also by the main office at Easthampton.

*Rhode Island, Warren. The foundation for the mill being built for the new Warren Worsted Mill has been finished and the contractor is working on the first floor.

Rhode Island, Westerly. The Pawcatuck Mills have put their carding and spinning departments on an overtime schedule.

New York, Union Course. It is reported that D. Nusbaum & Company, manufacturers of cardigans, sweaters, knitted ties, and fancy knit goods, have installed machinery to make knitted silk sweaters and other novelties.

*North Carolina, High Point. Building operations on the large new hosiery mill to be built by the Piedmont Mills Company will be started in a few days. This department will have a capacity of 1,000 dozens of hose daily. In an earlier report it was stated that the new mill would be built by the High Point Hosiery Mills, Inc. This is incorrect, although the Piedmont Mills Company and the High Point Hosiery Mills, Inc., are under the same management.

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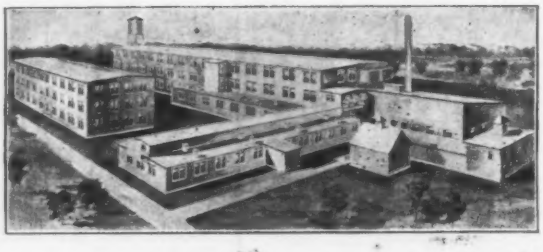

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MILL NEWS

North Carolina, Newton. Increases are to be made by the Fidelity Hosiery Mills Co. which include the enlargement of the plant. Women's seamless, ribbed and fleeced hosiery is manufactured on present equipment of 125 latch needle knitting machines. D. M. Ausley is president; John H. Phillips, treasurer, and S. T. Gaddy, superintendent. The treasurer and superintendent attend to the buying.

*North Carolina, Statesville. Six more knitting machines and one ribber are to be installed by the Walton Hosiery Mills, manufacturers of men's half hose, when they are running smoothly in the new Statesville quarters. This is a new concern which began operations a few months ago at Rocky Mount and recently moved its machinery to the Douthit Machine Shop Bldg. in Statesville.

*North Carolina, Statesville. The additional machinery equipment being installed by the Bradford Knitting Mill, Inc., will be in operation about October 1 and will give total equipment of 120 knitting machines making hose. Electric drive is being installed to take the place of the steam power plant. R. E. Clapp is treasurer, superintendent and buyer.

Pennsylvania, Allentown. The Rexall Knitting Company, Law and Chestnut Sts., operating a large equipment on fine silk knitted neckwear, and also a winding department in which they wind silk for the trade, have in contemplation the installation of machines for the manufacture of high grade silk hosiery for women.

Pennsylvania, Ephrata. Twelve new machines are to be added to the equipment of the Ephrata Hosiery Mill Company, and eight of these have been installed. Men's seamless cotton hosiery is manufactured. F. S. Weaver is treasurer, superintendent and buyer.

Pennsylvania, Hamburg. The Gotham Underwear Mill No. 2 has been sold by S. D. Bausher to a number of men who will operate the plant under the name of the Clover Underwear & Bleach Works. Application has been made for a charter. The new owners have a scheme of letting their employes acquire some of the stock in order to increase their efficiency. G. A. Zook, who several months ago started a small women's underwear plant at Hagarstown, Md., under the name of the Quality Mills, is president of the new concern and it is reported that the equipment of the Quality Mills is to be moved to Hamburg and installed in the Gotham Underwear Mill No. 2.

Pennsylvania, Honesdale. A new 3-story brick structure, 75 by 125 feet, has been built by the American Knitting Company on the lot purchased the first of the year and forms an L with the southern part of the old mill. Equipment is being installed which will practically add 50 per cent. to the production of sweaters.

*Wisconsin, Milwaukee. Work was started this week on the new $60,000, 4-story mill for the Van Dyke Knitting Company and it is expected it will be completed by next March. The dimensions are 100 by 150 feet.

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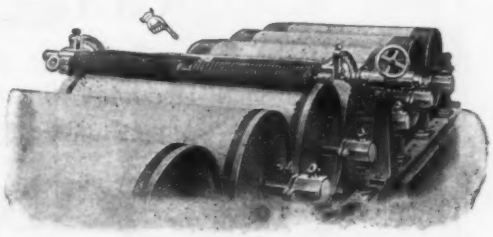

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MILL NEWS

Pennsylvania, Philadelphia. The Shorr-Wollman Knitting Co., which succeeded the Majestic Knitting Mills located at 253 S. 5th St., have removed the plant to larger quarters, leasing the top floor of the building at 334 Market St., where they are operating 8 knitting machines on fine silk neckwear. Several new knitters will be installed within a short time to enable them to increase their production. They are very busy.

Pennsylvania, Philadelphia. The Commercial Knitting Mills, operated by Steinberg & Lipshutz, located at 1649 N. 11th St., where they are manufacturing knitted silk neckties, are about to install five additional knitters for the purpose of increasing their production and keeping up with their orders. They sell direct to jobbers and retailers.

Pennsylvania, Philadelphia. The Red Star Knitting Mills, operating 15 knitters on sweater coats at 117 North 4th St., report that additional floor space will be leased by them. A number of new knitters will be installed with a view of enlarging their production.

Pennsylvania, Philadelphia. The Allen Knitting Mills Company has added enough new machinery to about double the production and expects to enlarge again in a few months. This concern recently removed from Columbia Ave. and Randolph St. to larger quarters at 11th and Westmoreland Sts. High grade ladies', misses', and children's union suits, vests and pants are manufactured.

Pennsylvania, Port Carbon. An addition is being erected at the plant of the Superior Knitting Company to give space for additional machinery. Cotton underwear is manufactured.

Pennsylvania, Richland. The Richland Hosiery Mills, A. C. Haak proprietor and manager, have installed four new knitting machines. Men's seamless cotton half hosiery are manufactured.

Pennsylvania, Temple. An automatic sprinkler system has been installed in the plant of the Maidencreek Hosiery Company, manufacturers of men's seamless and children's and infants' hosiery.

Rhode Island, Pawtucket. The new addition at the plant of the Lumb Knitting Company, on which work was started in May, is practically completed and carpenters, electricians and painters are finishing the interior. The enlargement is 100 by 100 feet, of brick, and gives the concern nearly double the old floor space.

*Wisconsin, Delavan. The Bradley Knitting Company has not definitely decided to add a yarn manufacturing department. They have in contemplation a two-set woolen yarn plant. This will not necessitate a new building as they can use some of the present space by a rearrangement of the machinery if they decide to spin. Plans have been completed for the new yarn dyeing plant recently reported, and this department is expected to be running by January 1. It will be located on the first floor of the 3-story warehouse and a shed will be erected east of the warehouse for storage purposes.

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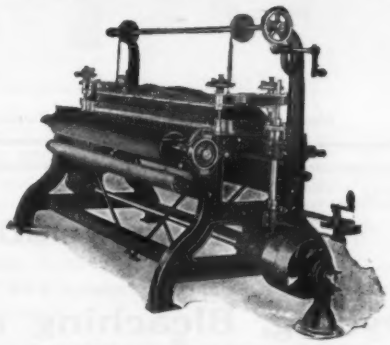

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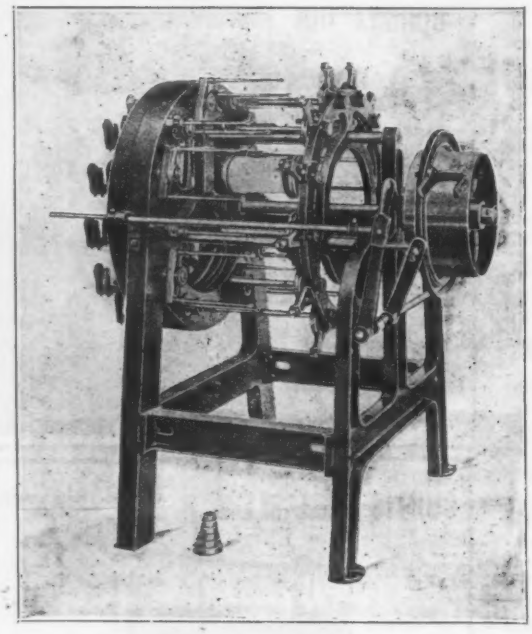

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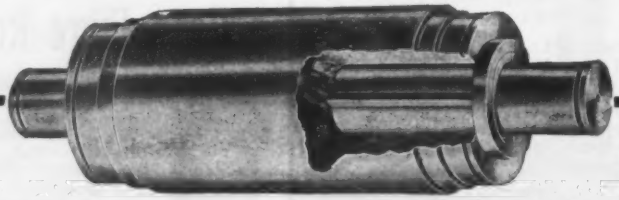

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WRITE FOR CATALOG 85-B

B. F. PERKINS & SON, INC. **HOLYOKE, MASS.**

MILL NEWS

*Tennessee, South Pittsburg. R. C. Aycock has completed the reorganization of the Aycock Hosiery Mills which he recently purchased from the Davis Hosiery Mills of Chattanooga. The capital stock is now $100,000. R. C. Aycock is president, treasurer and buyer, and W. E. Catron is superintendent. Charles Chipman's Sons succeed the Davis Hosiery Mills as selling agents. The plant contains 96 knitting machines and 210 ribbers making misses' fine gauge hosiery, giving employment to 210 hands. Construction work will shortly be started on a new dye house and finishing department and some other enlargements and improvements will be carried out. The rumor that Mr. Aycock would open a branch mill at Whitwell to knit hosiery which would be shipped to South Pittsburg to be finished is without foundation.

Washington, Seattle. Six new machines have been installed by the Saxony Knitting Co., manufacturers of jerseys, sweaters, bathing suits and hosiery. During the past few months a general enlargement of the business has been carried out.

Wisconsin, Depere. Enlargements and improvements are being made by the Oneida Knitting Company, Inc., including the erection of a new warehouse building with a concrete base and corrugated iron structure.

Wisconsin, Waupun. Plans are being made by the Paramount Knitting Company for a new mill building which will give enlarged facilities for the local plant. A site will soon be selected. The main office is in the Hunter Bldg., corner of Madison and Market Sts., Chicago, Ill. The State Board of Control has accepted the offer of the Paramount Knitting Company for a three-year contract for the labor of 300 prisoners at the State Prison. This contract begins in January, 1914, at which time the present contract for prison labor held by the Paramount Knitting Company will expire. The new mill building is an enlargement of the outside shop which supplements the prison labor.

Wisconsin, Sheboygan. A new warehouse is to be built by the Hand Knit Hosiery Company which will be 52 by 100 feet, equipped with sprinkler system and electric elevator.

Wisconsin, Whitewater. An entire floor in a modern building has been leased by the Bradley Knitting Company of Delavan and sewing machines operated by electric power will be installed. Seventy-five girls will be employed when the branch is opened.

Maine, Houlton. The Houlton Woolen Mill, which was closed during the summer, has resumed operations. During the suspension numerous repairs were made.

New Hampshire, Brookline. The Clifford Mitten Co., which discontinued manufacturing two or three years ago, is about to start business again making mittens and gloves. They will run from four to twelve Lamb machines and buy yarns in small lots from 2/12s to 2/20s. They will also do order work. Charles A. Clifford heads this concern.

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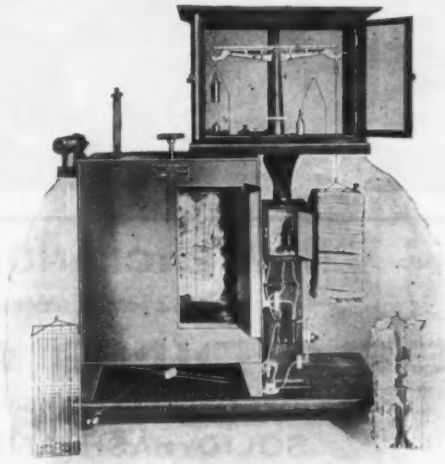

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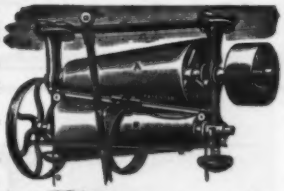
The Evans Friction Cone Pulleys



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They are guaranteed to do your work.

We'll furnish them for either floor or hanging use.

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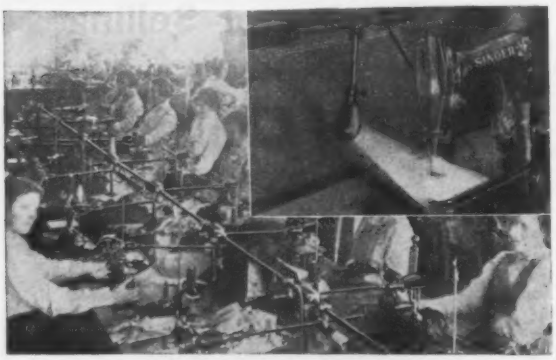

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The Hinsdill Universal Adjustable Fixture keeps the light just where needed. It saves the eyes—enables help to do better work.

The Hinsdill System

will double your light efficiency at your present cost—or give you the same or better efficiency at half your present cost.

Your own machinist or engineer can easily install both system and fixtures. Get price and descriptive literature.

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ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS

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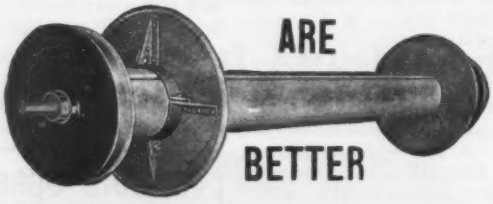

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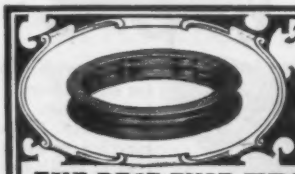

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MILL NEWS

North Carolina, Marion. J. W. Streetman and R. L. Greenlee are reported to have leased the Mt. Ida Hosiery Mill, which has been idle for the past two years. It is said they will operate the plant under the name of the Carolina Hosiery Mills. Mr. Streetman is a drug dealer in Marion. The Mt. Ida plant was established two or three years ago and was run only a short time. Fifty latch needle knitting machines were operated on men's and women's seamless cotton hosiery.

*Oklahoma, Oklahoma City. The new Oklahoma Hosiery Company is just beginning operations. When the plant is running in full they will have about 100 knitting and 7 sewing machines on women's hosiery, dyeing and finishing the product. This company was recently chartered with capital stock of $25.000. T. H. Lindley, formerly of Philadelphia, is president and buyer, M. J. Lindley is treasurer and J. B. Barker, superintendent.

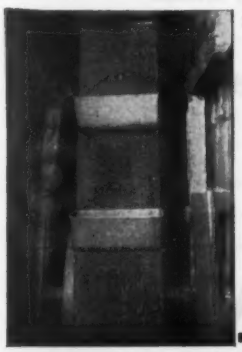
Pennsylvania, Boyertown. The knitting plant operated by Dr. Francis on women's ribbed underwear has been sold out to other parties who have removed the equipment to another location and started it up again. The plant was shut down for two or three years.

*Pennsylvania, Allentown. The new plant established here to manufacture astrakhans and other knitted fabrics and to do commission silk winding for the trade, is located at 314 North Church St. The equipment consists of four knitting heads and six winding frames. C. G. and C. A. Smith are the proprietors.

Pennsylvania, Philadelphia. Chas. Ackerman, operating the Lion Hosiery Mills at 110 Turner St. on women's ribbed and infants' and children's hosiery, with 50 knitters, 40 ribbers and 6 loopers, has recently taken over the plant formerly operated by the Bridesburg Hosiery Mills Co., located at Edgemont and Kirkbride Sts., Bridesburg, containing 38 knitters run on women's seamless 220-needle hosiery and started it up again under the name of the Eagle Hosiery Mills. There is a prospect that Mr. Ackerman will consolidate the two plants and run them under one head, but this matter will be decided at a later date.

*Tennessee, Englewood. Within a few days the new Englewood Mfg. Company will begin manufacturing. A 2-story mill, 40 by 65 feet, with boiler and dye room connected, has been constructed and is being equipped with 24 footers and 24 ribbers. Dyeing and finishing departments also are being equipped. One end of the mill has been arranged so that additions can readily be built to it.

*Pennsylvania, Allentown. Several months ago the organization of the Allen Underwear Company by H. C. Bolich and others was reported and it was generally understood that the new corporation would take over the knitting business of Mr. Bolich at 6th and Lehigh Sts. It is learned that the new concern may never start to do business. Mr. Bolich is continuing his plant as in the past under his own name.



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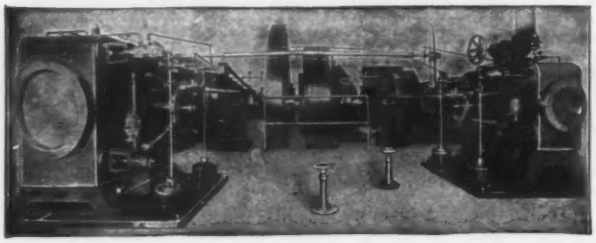

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TEXTILE FINISHING MACHINERY
ARTHUR BIRCH, Proprietor
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MILL NEWS

*South Carolina, Columbia. The work of repairing the mill of the Southern Aseptic Laboratories and putting an additional story, 40 by 125 feet, on the building has been started. The fire destroyed practically the entire plant with the exception of the card room, with loss estimated at $50,000; fully covered by insurance. Operations will be resumed in some departments in from two to three weeks. The capital stock of this company is $90,000. G. A. Guignard is president and treasurer and Paul A. Schulz is manager and buyer.

Connecticut, Somerville. A fire in the plant of the Somersville Mfg. Co. caused by lightning was put out by the automatic sprinklers without serious loss. A large barn owned by the concern was destroyed.

Connecticut, Stafford Springs. The woolen mill operated by Frederick Faulkner has been destroyed by fire, entailing a loss estimated at $75,000. Dress goods and men's wear were manufactured on 7 sets of cards and 45 broad looms. The property was owned by a concern known as the Middle River Mfg. Company of which J. M. Sheehan of Newburgh, N. Y., is president and was leased by this concern to Frederick Faulkner. Mr. Faulkner reports that it has not been decided whether to rebuild or whether he will locate at some other place.

Connecticut, Uncasville. The waste storehouse owned by the Uncasville Mfg. Co. has been destroyed by fire.

Massachusetts, Fall River. A small fire in the picker room of the Heywood Narrow Fabric Company caused slight damage. The plant is running as usual.

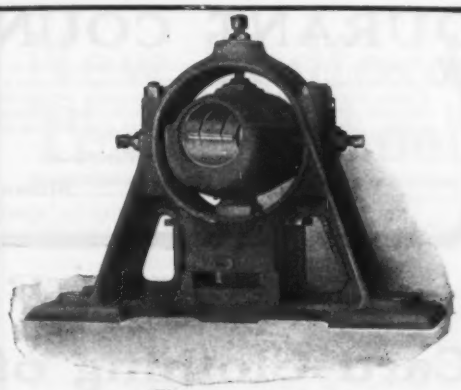
Massachusetts, New Bedford. Lightning struck the cotton shed of the City Mfg. Corp. and the building with contents was damaged by fire and water, causing loss of probably $3,500. The operation of the mill will not be effected.

Massachusetts, Pittsfield. The napping room of the Musgrove Knitting Co. was recently damaged by fire. The blaze was extinguished by automatic sprinklers with loss estimated at about $1,000.

New York, Cohoes. A fire in the plant of the United Waste Mfg. Company on Remsen St. was extinguished by the employes with slight loss.

New York, New York City. Damage caused by the recent fire at the plant of Bonnem & Co., Inc., 135th St. and Willow Ave., Bronx, was fully covered by insurance. Goods ready for shipment were not injured and repairs to the burned portion will be made at once, so that little delay in delivery of orders will be experienced. The concern manufactures sweater coats and fancy knit goods.

Pennsylvania, Philadelphia. Fire in the Wabash Mills, Nixon and Leverington Sts., Manayunk manufacturers of cotton carpet and upholstery yarns, damaged the plant to the extent of $1,000. The damaged portions of the building will be repaired at once.



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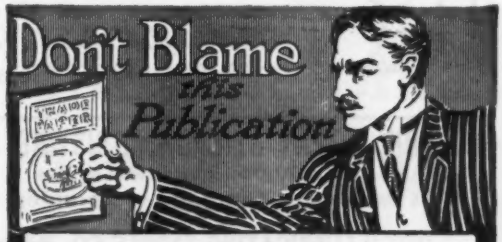

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Made of paper and wood,
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Not liable to break.

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BOX SHOOKS and CLOTH BOARDS.

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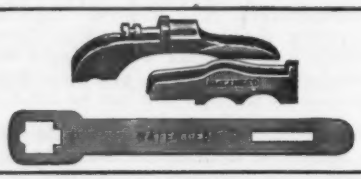

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BOSTON, MASS. ROCKFORD ILL GREENVILLE, S. C.

HAND KNOTTERS AND WARP TYING MACHINES

MILL NEWS

Pennsylvania, Emaus. The Emaus Silk Company has begun operations. This concern took over the Keystone Silk Mills, formerly owned by the Paul Gumbinner Company. J. H. Frederick is president and manager.

*Pennsylvania, Reading. The Berkshire Silk Mill will be started up again Sept. 22. Part of the mill has been leased by the Lion Silk Mills, H. I. Felberbaum, 111 5th Ave., N. Y., proprietor. The balance will be occupied by the Haledon Throwing Company whose main plant is at Paterson. There is no connection between these two companies.

*Canada, Ontario, Brantford. One hundred and fifty new spindles will be installed by the Brantford Cordage Co., Ltd., in the extension being built to the twine factory. The warehouse, recently destroyed by fire, has been rebuilt.

Connecticut, East Killingly. Several knitting machines have been ordered by the International Cotton Mfg. Company and will be used in the manufacture of sanitary napkins, a new line which has been added to this concern. Since control was purchased by the American Druggists Syndicate of Long Island City, N. Y., the output has been steadily increased. All departments are being gradually remodeled with a view to developing and extending the plant so that the capacity will be greatly increased. A bleachery is being built and a new storehouse will be constructed. Absorbent cotton is the chief product.

Georgia, Augusta. The Riverside Mills are arranging to add to their electric drive equipment and have placed orders with the General Electric Co. for a 150 k. w. generator, a 5 k. w. exciter and two 50 h. p. motors.

*Georgia, Savannah. The new Floyd Bagging Mills, reported incorporated several weeks ago, have begun manufacturing jute bagging to be used as covering for bales of upland cotton. They have 100 spindles and 3 looms operated by electric motors. The plant is located on Liberty St. Extension, also known as Louisville Road. The new concern has capital stock of $50,000. T. B. Floyd is president; M. H. Floyd, secretary and treasurer; and T. B. Floyd, Jr., agent and buyer. The Messrs. Floyd have operated the Floyd Cotton Pickery for several years.

Illinois, Chicago. Arthur L. Stuart, 1800 Ballou St., is preparing to open a dyeing and bleaching plant to handle millinery goods.

Massachusetts, Boston. The Carton Belting Company, manufacturers of belting at 52 Everett St., Allston, are building an addition to their plant.

Massachusetts, Ludlow. Additions to the steam power plant of the Ludlow Mfg. Associates, which are being carried out under the supervision of Lockwood, Greene & Company, of Boston, are well under way. The foundation walls are practically completed for the extension to the boiler house, and brick work on the turbine house extension has reached the first floor level.

New Bedford Textile School

This school is located in New Bedford, Mass., a rapidly growing city and already the largest producer of fine cotton goods in this country.

Instruction given in the theory and art of cotton manufacture in all its branches.

The school has one hundred ten machines for instruction purposes in carding, spinning and weaving departments; seventy in knitting department, the most complete department of the kind in equipment and scope of instruction in this country; twenty-seven machines in machine shop; thoroughly equipped departments in chemistry and dyeing, in designing, and mechanics.

Every instructor a man of broad experience and training.

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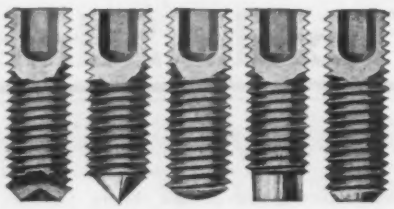

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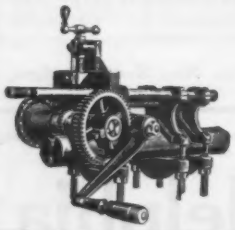
is not complete unless equipped with one of these

BURR KEYSEATERS



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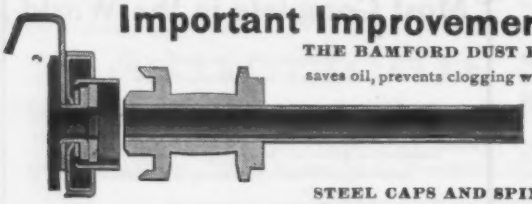

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MILL NEWS

Pennsylvania, Easton. A new concern known as the Easton Silk Dyeing & Finishing Co. will locate at 14th and Peach Sts., and has awarded contract for mill buildings to Louis E. Falkner of Philadelphia. The concern will do dyeing of silk piece goods, also printing, and later on plans to build an addition for bleaching, dyeing, and printing cotton piece goods. Construction work is to be started at once and the buildings completed within two months. The land secured is 220 by 190 feet, and the buildings will include a dyehouse, 50 by 80 feet, 1 story high, a finishing mill of the same dimensions, and between these two buildings there will be an engine house, 16 by 32 feet, and a boiler house, 40 by 30 feet. The buildings will be of brick construction. The officers are A. J. Keenan, Philadelphia, president; Robert Zwald, Easton, vice-president; J. J. Keenan, Philadelphia, secretary; and Charles Zwald, Easton, treasurer.

Pennsylvania, Philadelphia. George S. Justis & Co., manufacturers of passementerie trimmings on 12 narrow looms and 115 braiders, will start an annex or secure larger quarters. An annex will probably be established as the lease on the present quarters runs for about two years longer.

Pennsylvania, Philadelphia. August Boeschenstein & Co., under the name of the Carlisle Mills, are setting up 9 looms for the manufacture of fluff huck, Turkish towels and wash rags at 243 E. Ontario St. They are buying 10, 12 and 14 single yarns and 1/14 and 2/20 warps.

Pennsylvania, Philadelphia. The Collins & Aikman Co., manufacturers of cotton, linen and mohair plushes, etc., on 100 looms on River Road, Manayunk, have placed a contract for alterations to their buildings to cost several thousand dollars. The operation will be commenced at once.

Pennsylvania, Philadelphia. The contract for the erection of the new power house to be built for the Ontario Dye Works, dyers and mercerizers of cotton yarns at Ontario and D Sts., has been awarded and the operation will be started at once. The cost is estimated at $13,500.

*Pennsylvania, Towanda. Schetty Bros. Company, successors to the Schetty Silk Dyeing & Finishing Company formerly located at Paterson, have begun operations and the concern now has plans for an addition to dye blacks. This department is to be ready for operation in November.

*Pennsylvania, Reading. Schaeffer & Co., reported last week as installing a number of new braiding machines for manufacturing their lines of shoe laces and braids, expect to add a new department for commission silk winding.

Rhode Island, Bradford. It is reported the Bradford Dyeing Assn. (U. S. A.) has plans for the erection of another addition. The contract has been awarded for twenty new tenement houses for operatives.

Rhode Island, Central Falls. Richardson, Foster Company, dyers, bleachers and finishers of worsted tops, yarns and piece goods, have awarded the contract for the construction of a large water tank to the B. T. Smith Construction Company.

DIXON'S
Graphite
Cup
Grease

Is Lasting and Economical.
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Made in JERSEY CITY by the
JOSEPH DIXON CRUCIBLE COMPANY
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FALL RIVER, MASS.
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LOOMS
For PLAIN and FANCY WEAVING
Represented in the South by
O. A. ROBBINS, - - - CHARLOTTE, N. C.

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A new and revised edition of this practical book on the sizing of cotton yarns. In the preface to "*The Practice and Chemistry of Sizing*," the authors say: "Many of the leading manufacturers would be astonished at the amount of saving which could be effected in their sizing if they could only be persuaded that the results they get could be obtained equally as well at a very much less cost." They follow this with methods of getting better results at reduced cost.

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Lord & Nagle Company

144 Congress St., Boston, Mass.

MILL NEWS

*Rhode Island, Pawtucket. The projected addition to the plant of the Blackstone Webbing Company, for which plans have been made, will be one story high, 40 by 30 feet, of brick construction, and will probably be built in the early spring.

*Rhode Island, Phillipsdale. Work on the construction of the enlargement to the dye house of the Phillipsdale branch of the Glenlyon Dye Works, recently noted, is progressing rapidly and it is probable that the initial installation of machinery will be made within a few weeks.

Rhode Island, Providence. An enlargement is being built to the machine shop of the Providence Dyeing, Bleaching & Calendering Company on Valley St. An additional story is to be added. A new chimney was recently completed. The plant is running full time and is very busy.

Rhode Island, River Point. Operations at the plant of the Continental Finishing Co., which has been closed for a time pending certain financial adjustments, have been resumed with a full force, and goods which had been removed by customers are being returned to be finished.

Rhode Island, Warren. A new mill, 75 by 100 feet, is to be erected on Cutler St. by the Swiss Textile Company, manufacturers of sanitary napkins, belts, etc. The building will at first be two stories high, but may be increased in height later. It will be constructed of cement blocks. The Swiss Textile Company has been operating on a small scale on Child St. for several years. Last May the business was incorporated with capital stock of $25,000. George Barker is president, and C. A. Gonzenbach, treasurer.

*Wisconsin, Superior. It is understood that the reorganization of the Superior Knitting Mills has been effected and that operations have been resumed temporarily in the old quarters, with the intention of removing to a new location shortly. The company is composed of some of the old stockholders together with new interests.

Pennsylvania, Allentown. Report has it that the bondholders of the old Southdown Knitting Co. are endeavoring to reorganize the company and resume manufacturing and that a meeting will be held in the Fall and an effort made to commence operations some time during the year 1914.

PROVIDENCE MENDING CO.

Burlers, Speckers and Menders of Textile Fabrics

2600 North Sixth St. Bell Phone, Diamond 628

PHILADELPHIA, PA.

MILL NEWS

Massachusetts, North Chelmsford. Plans are being made by the Lowell Textile Company for building an addition. Union huck towels and crashes are manufactured.

*New Jersey, Trenton. The new plant of the Woven Steel Hose & Rubber Company, for which contracts have just been let, will be much larger than the one destroyed by fire. Additional land has been purchased and the facilities will be largely increased to provide for their growing business in the manufacture of air, steam and water hose, packings and brake linings. J. Russell Kelso is vice-president and general manager.

New York, Utica. Operations have been partly resumed at the plant of the Utica Dyeing Company and repairs to the burned portion will be made as rapidly as possible. Two of the four floors were burned in the recent fire, in which one of their employes was killed, and the property loss is estimated at about $10,000.

*North Carolina, Greensboro. Buildings for the new print works departments of the Proximity Mfg. Company are about completed and some of the equipment is being installed. The main plant is 250 feet long by 50 feet wide, 2 stories high. The dye house is 50 by 75 feet, and the boiler room, 40 by 60 feet. Electric power from the power house of the White Oak Mills, controlled by the same interests, will be used. As noted in a previous report this new department will represent an investment of $150,000 to $200,000, and is designed to have a daily capacity of 100,000 to 125,000 yards of dyed and printed indigo fabrics. When the plant is started up about November 1, the output will be approximately 25,000 yards per day. The new department will not dye or print such fabrics as indigo blue denims, dyed in the warp, which are made in both the Proximity and White Oak Mills, but will be devoted exclusively to the handling of piece goods manufactured elsewhere and shipped to Greensboro to be dyed and printed. A specialty is to be made of heavy goods such as are used for the manufacture of working men's garments.

Alabama, Bessemer. Representatives of a hosiery mill have been here looking over sites with a view to establishing a branch plant.

"NO WASTE"

Seamless Hard Fibre Roving Can

The Only Can For Fine Spinners and the Very Best for All Grades of Work.

It does not have the riveted seam that strains and breaks the sliver.

NO SEAMS or RIVETS

Absolutely Smooth

No Waste or Broken Ends

Write for prices.

MANUFACTURED BY THE

Standard Fibre Co.

SOMERVILLE, MASS.

DRONSFIELD'S

Patent Automatic

Flat Grinder

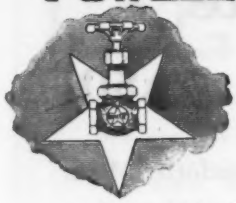
Ensures:
BETTER SETTING!
BETTER CARDING!
MORE CARD-POINTS AT WORK!

OVER 1500 IN USE

Made by the same Dronsfield as the world-famed Traverse & Long-Roll Grinders.

Supplied by all the Textile Machinery Importers, - Boston, Mass.

POWELL VALVES



We manufacture a complete line of globe, angle, cross check and gate valves.

Ask your dealer for Powell Valves or write us.

THE WM. POWELL CO

DEPENDABLE ENGINEERING SPECIALTIES

CINCINNATI

WILLIAM SCHOFIELD CO.

Krams Ave., formerly Church St., Manayunk, Phila., Pa.

Textile Machinery

Makers of Rag, Wool, Hair and Finishing Pickers, Automatic Square and Cone Willows, "Schofield" Intermediate Feed for Cards, Rag and Extract Dusters, Waste Pullers, Worsted and Shoddy Reels, All Kinds of Spike and Slat Aprons.

Special Machinery Built. General Machinery Repairs.

Relagging Picker Cylinders a Specialty.

New Ideas

Always Surprise Us

The mill man who has never given

Wyandotte Textile Soda

a thorough trial thinks it no different and no better than a number of other alkalies which he might name.

Equally true, the mill man who is using "Wyandotte" knows it has no equal, because it does what no other article can do. At first he, too, was somewhat skeptical as to its superior merits, but when he saw what it did, once, twice, yes, every time he used it, his doubts gave way to surprise. He was truly amazed that such a difference could exist between Wyandotte Textile Soda and other articles often used for similar purposes. He knows it pays to use "Wyandotte".

Order from your supply house and write us for further information. We shall also be glad to tell you of equally profitable results from the use of

Wyandotte Concentrated Ash.

The J. B. Ford Company, Sole Manufacturers, Wyandotte, Mich.

This Soda has been awarded the highest prize wherever exhibited.

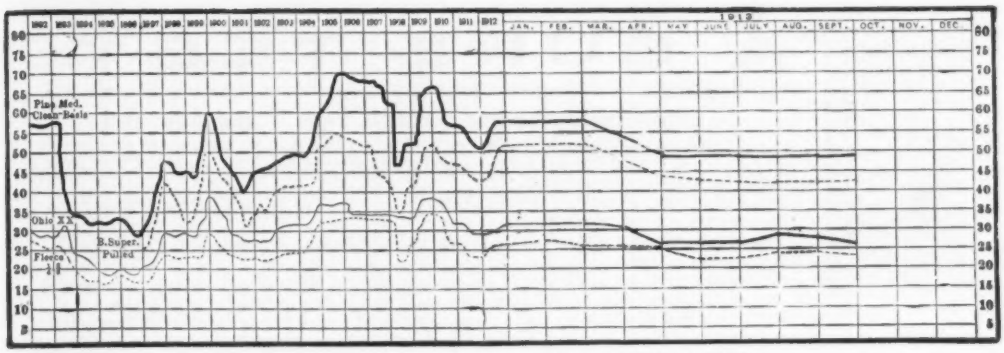


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

THE WOOL MARKET

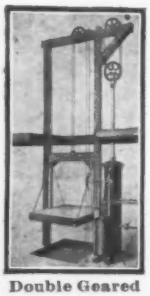
The domestic market for wool has been quiet, and the trade has been waiting for the long talked of change in the tariff to become assured. Now that the dates on which free wool and the new rates on wool goods go into effect are known, dealers and manufacturers are planning for future business, which will develop as time passes. The question of whether the best bargain can be made in wool or tops is facing spinners and experience must be acquired before spinners will feel warranted in operating on a large scale. For this reason there is not likely to be any sudden influx of either wool or tops when the Underwood rates go into effect. Foreign markets are steady and there has been some activity in the trade in low luster wools on this side. The goods market is not satisfactory. Buyers have been operating cautiously, many of them apparently having expected that the new tariff would bring about a sharp decline in prices, but in this they have thus far been disappointed. The slow business on goods has had its effect on the wool market, but on all sides there is a feeling of confidence in the future, both as to wool and wool goods, the trade taking the view that the competition with foreign goods will not be as serious as expected, at least for six months to come.

MILL NEWS

*South Carolina, Anderson. In August it was reported that a manufacturer of absorbent cotton was in communication with the Chamber of Commerce regarding locating a branch in Anderson. The concern interested is the Aseptic Cotton Products Company of Chattanooga, Tenn. Robert T. Cameron, president and general manager, has been here conferring with the manufacturers' committee and will return in a few weeks and take up the matter further. Columbia is also being considered as a possible site for a plant, the object of the concern being to establish branch plants at a number of places. The Aseptic Cotton Products Company is a reorganization of the Southern Aseptic Cotton Company, chartered under the laws of West Virginia with authorized capital stock of $500,000. The reorganization of the old company was made three or four months ago for the purpose of securing additional capital in order better to develop the opportunities offered by a new process for manufacturing absorbent cotton, gauze and bandages claimed to have been discovered by Oswald F. Rothe, superintendent of the concern.

LOGWOOD BLACKS
HOW TO TELL THEM
We have been asked to furnish a means of identifying Logwood Blacks.
A simple characteristic test for a Logwood Black is to spot the dyed material with strong oil of vitrol. The spot turns slowly to a dull, bricky red.
This test will identify unfailingly Logwood Blacks.
AMERICAN DYEWOOD COMPANY
NEW YORK PHILADELPHIA BOSTON HAMILTON, ONT.

Direct Acting



Double Geared

A SURE TEST.

To Find One of the Big Fools in Your Town, Try This:

A Certain Manufacturer (of course it wasn't you!) in order "to please the women folks," and "to keep up with the procession" and to have "a little fun with the boys sometimes"

Spends 4000 good REAL DOLLARS—more or less—for a big Red-White-Blue-Black-Yaller or Striped Automobile.

In three, four or five years the aforesaid Woman Pleaser, Money Spender, Dash Cutter, Fun Getter goes to the second hand dealer.

"Traded-in"—and everybody always gets such a Good Trade! Well, I guess so!

Then down in the old Factory where all the money is manufactured that is required for the necessities and extravagances of life, when it comes to an elevator installation, what is the conversation! When an elevator proposition comes up, what happens?

"Ridgway, what's the price of your Steam-Hydraulic Elevator you blow so much about?"

"Steen hundred and steen."

"What! W-h-a-t!!! That much for just an Elevator. Must think we're made of money."

"Yes, but we guarantee it **to run without cost, fool proof, always goes, no repairs, goes when the engine shuts down, guaranteed for life.** NO PAY UNTIL IT MAKES GOOD."

And listen, Mr. B. F., the Ridgway Elevator that will serve your floors forever, costs but a fraction of your Automobile that serves your pride and your pleasure only a year or two, and it costs nothing to run besides. Ketch on, old fellow, and

"HOOK 'ER TO THE BILER."

CRAIG RIDGWAY & SON CO., Coatesville, Pa.

ELEVATOR MAKERS TO FOLKS WHO KNOW

The Arabol Manufacturing Co.

Offices: 100 William St., N. Y. Factories: Brooklyn, N. Y.

Manufacturers, Importers and Exporters
of all Materials used in

Sizing, Finishing, Softening, Filling and Weighting of Yarns, Fabrics and Raw Stock

Sizing, Tallows, Soluble Grease, Soluble Oils, Gums, Glues, Gum Arabol, Lancashire Size, Waxes, Finishing Pastes, Soaps, Glycerine, Readymade Heavy Size, Sago and Tapioca Flours, Dextrines, China Clay, Soluble Blue, Bone Grease, Magnesium.

Special Compounds for Warps where stop motions are used.

Weighting compounds for colored and white warps.

Finishing compounds for all classes of fabrics.

Silk Finishes for Satin Taffetas.

The Arabol best grades of cotton warp sizing compounds make the "finest weaving, and will hold the 'fly.'"

These compounds are based on the best practical experience and the best materials used in their manufacture.

TRADE MARK

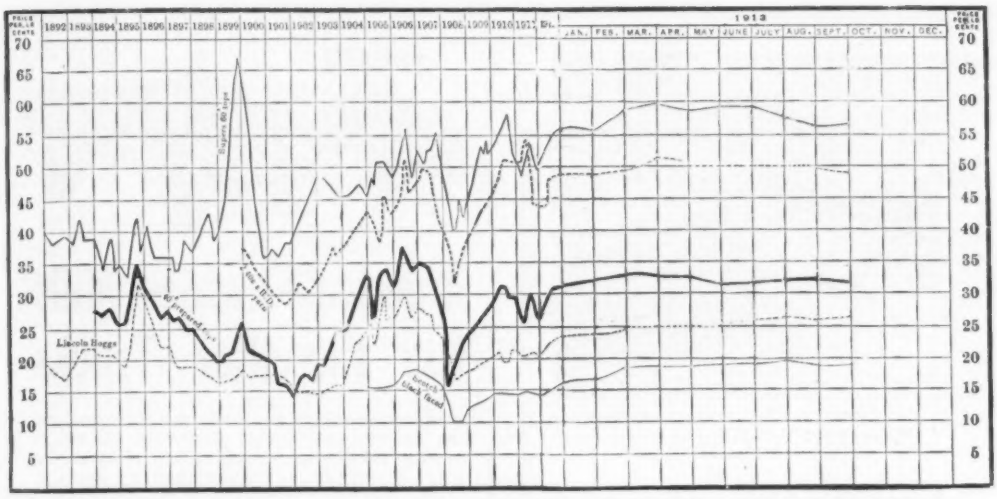


CHART SHOWING COURSE OF PRICES FOR WOOL, TOPS, AND WORSTED YARN AT BRADFORD, ENGLAND

THE BRADFORD MARKET

Bradford, Eng., Sept. 26, 1913.

Holidays have been curtailing the consumption of material in this market and purchasers of tops and wool have been delayed pending the opening of the sales in Australia and London. The maintenance of the established prices in these auctions suits holders very well and now the critical factor remaining is the demand from America. The Continental centers which consume Bradford crossbred yarn are all in a poor way of business. The consumption of botany for fine cloths is dropping off and the trade requires a fillip such as American buying orders might give. Much ingenuity has been expended in arguments as to the probable extent of American demand and the form in which it is likely to show itself first—whether in business in wool, tops or pieces. The probability that it will come in one way or another has heartened topmakers to stand to their quotations, although little business could be done upon them.

Domestic prospects are not unfavorable and the time is at hand when new business can generally be expected. Those who counted on new developments during September have been disappointed, but October is the natural time.

English wools are held very strongly and American prospects coupled with the short supply of these qualities provide farmers and country dealers with their excuse.

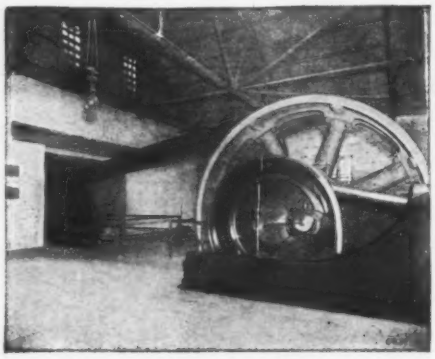
South Carolina, Anderson. At the sale of the property of the Cox Mfg. Company the plant was purchased by Wellington, Sears & Company of Boston for $125,000, the upset price fixed by the court.

MILL NEWS

*South Carolina, Greenville. In connection with the increase in the capitalization of the Westervelt Mills the company will very soon put out an issue of preferred stock that has already been subscribed for at par. It is not planned to make any increases or improvements in the plant. The mill is a new plant, complete in every respect, and has been in operation only about twelve months. Fine lawns and fancies are manufactured on equipment of 52,640 ring spindles and 1,288 looms.

South Carolina, Greenville. The South Carolina Dept. of Agriculture has published statistics of the textile plants in South Carolina for the past year. It is shown that the capital stock of mills have been increased by $7,250,000. The value of the products has been increased by $5,239,000. The equipment has been increased by the addition of 153,516 spindles and 4,813 looms. The report also shows a large increase in the number of adult male employes over all other classes. Other interesting figures are the report of the total capital stock, which is placed at $75,597,000; capital invested in plants, $88,763,000; number of spindles, 4,527,000; number of looms, 111,483; number of knitting machines, 1,599; the power used generated by water is placed at 24,783 h. p.; and steam generated, 75,726 h. p.; the electric power generated by water is 66,942 h. p.; and the electric power generated by steam, 5,630 h. p.

South Carolina, Rock Hill. Reports are current which state that the Hamilton Carhartt Mfg. Company has been incorporated to establish a cotton mill. The facts are that a new corporation has been formed under the style of Hamilton Carhartt Manufacturer of South Carolina to make overalls and kindred goods. Space is rented from the Hamilton Carhartt Cotton Mills and the cloth is bought from them. Both the cotton mill company and the new concern are controlled by Hamilton Carhartt of Detroit, Mich.



Finishing Mill Drive in a Cement Mill

Stevedore Rope Gives Maximum Service

THIS is due to the careful selection of the fibre used in its manufacture and to our system of treating each rope unit with a special friction reducing compound. This internal lubrication reduces to a minimum the grinding and wearing action between internal fibres of the rope, thus adding greatly to the life of the rope and the efficiency of transmission.

Let us know the size rope you use and we will send you a sample of Stevedore Rope for your inspection.

If interested in the more economical system of transmitting power, write today for a copy of our book W 12-S "Manila Rope." It contains a large amount of engineering data and also describes Hunt Tension Adjusting Coupling which makes splicing unnecessary.

Coupling spliced in the rope ready to put on the drive

C. W. HUNT CO., Inc.

West New Brighton, N. Y.

Designers and Manufacturers of Apparatus for the Automatic Handling of Bulk Material 26

America's Largest Mills Use KisselKar Trucks

The American Woolen Company is zealous in the interests of its stockholders—which means that it demands the fullest efficiency in every department of its mammoth business.

It follows that the American Woolen Company is a careful and discriminating buyer—no experimental purchases are tolerated at any of its various mills.

Three KisselKar Trucks were bought by this company on their record with other companies known to conduct business along similar careful lines.

A truck to be *right* must have power plant, transmission and radiator suspended on sub-construction—four speed gearset—lock on the differential to pull a stuck or slipping wheel out of difficulty—motor of tried and unquestioned power and ability—plenty of reserve strength—general construction that will resist vibration. *In brief it must be like the KisselKar.*

KisselKar Service Contract

insures prompt and skillful attention to truck owners, offering a definite and liberal service policy, ample and accessible facilities and factory trained mechanics.

SIX SIZES

1,500 lbs., 1, 1½, 2½, 3½, 6 tons

Send for Truck Portfolio with hundreds of illustrations of KisselKar Trucks in actual use.

Kissel Motor Car Company

528 Kissel Ave., Hartford, Wis.

New York, Minneapolis, Chicago, Philadelphia, Milwaukee, Los Angeles, San Francisco, Oakland, Dallas, Boston, St. Paul, Kansas City, and over 300 other leading points.

KISSELKAR TRUCKS

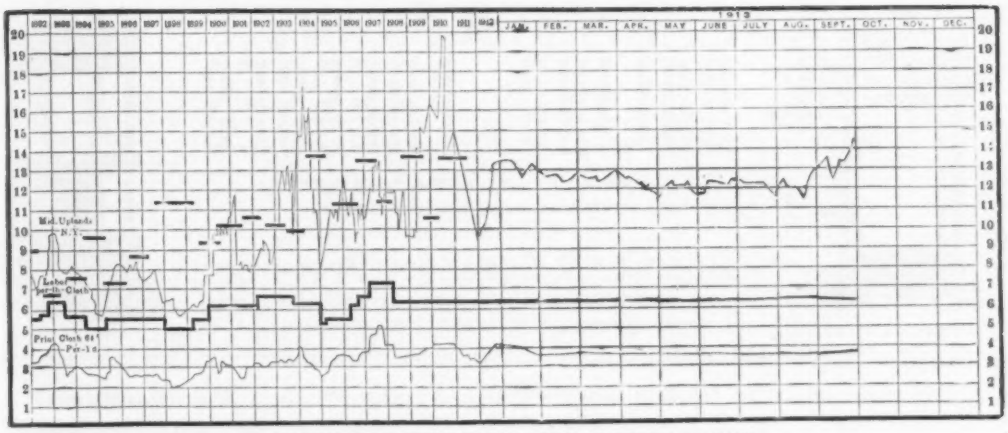


CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE

The short, heavy, horizontal lines indicate the size of the cotton crops in millions of bales.

THE COTTON MARKET

The advance in the price of cotton has been due to the belief that the supply of the staple this coming year will be considerably below the amount necessary to meet the demand. In all probability the advance would have been much greater if it had not been for the prospect of legislation in this country regulating trading in cotton futures. At this writing the question is still in dispute between the two Houses of Congress, and until it is settled the cotton market will be under a restraint that will tend to prevent further advances. Once settled, one way or the other, the trade will know better what to count on and the market will be controlled by the conditions of supply and demand, and speculation.

The cotton goods trade has been unfavorably affected by the increase in the price of cotton and predictions are freely made that the boom abroad is approaching an end. The movement of raw cotton into sight from Sept. 1 to Sept. 26 is reported by the "Chronicle" for a series of years as follows:

Year	Bales
1913, Sept. 26	1,373,999
1912, Sept. 27	1,287,526
1911, Sept. 29	1,477,461
1910, Sept. 30	1,181,451
1909, Oct. 1	1,499,720

The world's visible stock on Sept. 26 is estimated by the same authority at 2,540,051 bales, as compared with 2,673,485 bales on the corresponding date in 1912, 2,272,554 bales in 1911, and 1,890,305 bales in 1910.

Quotations for leading grades of Egyptian cotton are reported by Richards, Atkinson & Haserick as follows:

S. E. P.	24
O. R. D.	23
T. I. Z.	22¼
A. D. E.	21¾
M. A. H.	19⅛

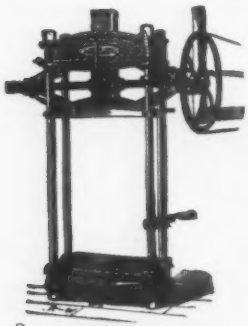
MILL NEWS

New Jersey, Paterson. The ten plants of the Ashley & Bailey Company are to be sold in the voluntary liquidation proceedings between October 14 and October 21, at unrestricted public sale conducted under the management of J. E. Conant & Company, auctioneers, of Lowell, Mass. The mills at Paterson, including the plant of the Hawthorne Silk Company, will be sold on October 14; the plant at York, Pa., will be sold on October 16; the mills at Columbia and Marietta, Pa., will be sold on October 17; the Coatesville, Pa., plant on October 18; and the plant at Fayetteville, N. C., on October 21. An elaborate, illustrated book forming a detailed catalogue of all the plants has been compiled and issued by J. E. Conant & Company and will be sent to interested parties.

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes

SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES

Phone Connections. Works, 2046-48 Amber Street, PHILADELPHIA, PA.



KNUCKLE JOINT.

Boomer & Boschert

BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size Any Power

Boomer & Boschert Press Co.

338 West Water St., SYRACUSE, N. Y.

Southern Agent, A. H. WASHBURN, Charlotte, N. C.

HYDRAULIC.

Announcement of Importance to Wide Awake Woolen Manufacturers!

On and after **September 24, 1913,** our lines of **Kaplan New Woolen and Worsted Clips** will be **ready** for the coming **Heavyweight Season.**

Come and avail yourself of the opportunity of getting stock to make the **Most Stylish—The Strongest—The Best Feeling Medium Priced Woolens,** which will be the greatest protection the Woolen Manufacturers need for a successful season and to enable them to defy the whole world.

D. KAPLAN & COMPANY

7 Vestry Street - - New York City

"None Better Made"

COOPER Hewitt light will make money for you by **increasing output**—by **decreasing spoilage.**

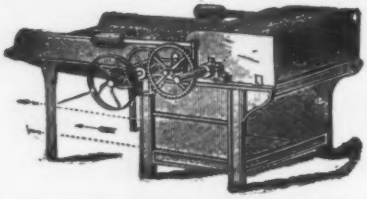
Send for Bulletin No. 738, "Better than Daylight."

Cooper Hewitt Electric Company

8th and Grand Streets Hoboken, N. J.

Geo. W. Gerry & Son, ATHOL, MASS.

MANUFACTURERS OF



Lumpers

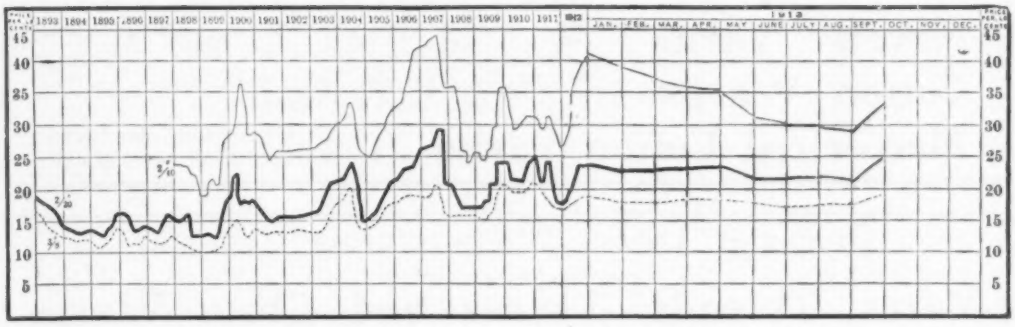
Wool and Waste Dusters

Rag Dusters, Nappers

Improved Cloth Measuring Machines

Lumper and Duster Cylinders Refilled and Repaired

Yarn Department



GRAPHIC CHART SHOWING RANGE IN THE PRICE OF COTTON YARN TO DATE.

THE COTTON YARN MARKET

The cotton yarn market has advanced rapidly during the month and is very strong at the present time with a good prospect of further advances. There has been an active demand for yarns of all descriptions and for deliveries covering the next four or five months. Spinners are not inclined to book more business as they have a sufficient supply of contracts on hand and also because of their inability to secure cotton in the present unsettled condition of the market.

There is a good supply of yarn on hand in almost all staple numbers, but apparently not enough to weaken the market for any particular size. There are indications that present stock will be enough to take care of the demand both this fall and winter when climatic conditions are such as to delay shipments to the various markets.

It is reported that large stocks of foreign textiles were held in bond at the different ports of the larger cities awaiting the passage of the Wilson bill, but just what these imports represented no one seems to have a clear idea. While some little apprehension is expressed, manufacturers are taking little chance of being caught without a sufficient supply of stock on hand to cover their requirements. So far as the spinner is concerned it seems almost impossible to obtain a price for any reasonable delivery upon such staple numbers as 1/14s warps, 2/20s skeins, 2/20s warps and 2/30s warps, etc. Few houses were inclined to make sales in these numbers the last week of the month unless they had them secured by previous contracts.

Prices are at least two cents per pound higher than the last of August. Business conditions in the Philadelphia district are exceptionally good with all lines of textiles, excepting possibly the upholstery trade and this line which has been doing a fair business does not seem to be as active as the others.

Eastern Cops

6s	20¾
8s	20¾
10s	23¼
14s	24¼
16s	24¾
18s	25¼
20s	25¾
22s	26¼
24s	26¾
26s	27¼
30s	28¼
34s	30½
36s	31½
40s	33

On cones, ¾c. more up to 14s; 1c. more from 15s to 22s; 1½c. from 23s to 35s, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler

12s	24½
14s	25
18s	25½
20s	26
24s	27
26s	28
30s	30
36s	37½
40s	39½
45s	43½
50s	46½
55s	48
60s	53

Eastern Two-Ply Warps, Carded Peeler

2/30s	39½
2/36s	37½
2/40s	39½
2/45s	43½

THE J. R. MONTGOMERY CO.

Windsor Locks, - Conn.

MANUFACTURERS OF

Novelty Yarns — Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps — on Beams, Jack Spools, Tubes and Cones. In Fancy Twist, Colors and Printed.

Mercerized Cotton Yarns — Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Greene & Daniels Manufacturing Company

Combed, Carded and Gassed

Yarns, Threads, Twines and Chain Warps

Dye Sulphur Blacks Direct in Cops, Cones or Tubes

Colored and Bleached Yarns Furnished in any manner desired by the trade

Pawtucket, R. I.

MONUMENT MILLS, HOUSATONIC, MASS.

HIGH GRADE COTTON YARNS White, Colors, Bleached

On Beams, Jack-Spools, Cones, Skeins and Chain Warps

FAST-BLACKS & COLORS | For Woolen Mills a Specialty | WE SELL DIRECT

C. MOORE & CO.

Manufacturers of

Twines, Threads and Yarns

Jacquard Harness Twines of all kinds on hand and made to order

S. W. Cor. Fifth and Market Sts., Phila.

JOHN F. STREET & CO.

Cotton Yarns

PROVIDENCE, R. I.

Providence, Chicago, Philadelphia, New York

JAMES E. MITCHELL CO.

COMMISSION MERCHANTS

COTTON YARNS

122-124 Chestnut Street, - - - Philadelphia, Pa.
Brown Building, 185 Summer Street, - Boston, Mass.

William Whitman & Co

COMMISSION MERCHANTS

COTTON and WORSTED YARNS

BOSTON NEW YORK PHILA. CHICAGO CHARLOTTE

LUDWIG LITTAUER

YARNS

Tram, THROWN SILK, Organzine.
ARTIFICIAL OR WOOD SILK.

Plain, Gassed, Mercerized, Prepared and other Cotton Yarns. Polished and Glazed Threads and Yarns. Mohair and Worsted, Tinsel and Turkey Red Yarns.

Best Quality Harness Twine

109 GREENE STREET, NEW YORK
Silk Throwing Mills BOONVILLE and YONKERS, N. Y.

YARNS

Students Cotton Spinning

By NASMITH

Price $3.00. Express prepaid

FOR Student and Manufacturer. Covers all operations from ginning through ring and mule spinning.

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8s and 9s	22
10s	22½
12s	23
14s	23½
16s	24
18s	24½
20s	25
22s	25½
24s	26½
26s	27
30s	28
40s	35
50s	41

Southern high grade mule yarns:—

Cones

10s	24
12s	24½
14s	25
16s	25½
18s	26
20s and 22s	26½-27
24s	27½

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6s and 8s	21½
10s	22

Eastern cones (high grade quality):—

10s	24
12s	24½
14s	25
16s	25¾
18s	26¼
20s and 22s	26¾-27¼

Skein yarn (mostly Southern):—

4s and 8s soft	22
10s and 12s	22½-23
14s and 20s	23½-24½
22s	25
10/2	23
16/2	24
20/2	25
30/2	27½
40/2	33
8/2	22
7/6	22

Southern warps:—

10/1	21½
14/1	22
16/1	22½
20/1	24
22/1	24½
26/1	25½
30/1	27
8/2	22
12/2	22½
14/2	23
16/2	24
20/2	25
26/2	26½
30/2	27½
40/2	33
50/2	41

MILL NEWS

*Massachusetts, Worcester. H. M. Witter & Co., Park Ave., manufacturers of tapes, bindings and other narrow fabrics, are only contemplating the putting in of electric power equipment. Previous reports have stated that it had been decided to make this change.

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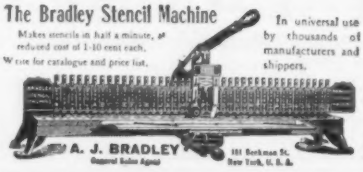

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PHILADELPHIA OFFICE "THE ARCADE"

THE LINEN YARN MARKET

Conditions in Belfast show that little change of any consequence has occurred in the spinning trade. Business is being done on a hand to mouth basis. This seems to be satisfactory to all concerned, with a hardening tendency in all departments and with heavy and coarse ends in both line and tow being exceedingly active and almost impossible to purchase at satisfactory figures. There is, however, a tendency to neglect superior spinnings in the fine ends. Continental yarns are scarce. New lists have been issued showing an increase of one and a half to three pence per bundle for both line and tow yarns above prices quoted by local spinners. It is anticipated that local spinners will show an advanced list at an early day. Great encouragement has been given the spinners by the demand for yarns from the United States, as inquiries from that quarter have been of a gratifying character in anticipation of the reduced tariff which will enable a considerable number of lines of goods to be made in America which have hitherto been made in Ireland. The demand for the production of local looms is increasing from all quarters of the globe.

American business has been almost at a standstill pending the settlement of the tariff question, but orders have been placed with local agents for large quantities of yarns for delivery on the basis of the new tariff. There is the usual demand for staple numbers of hosiery yarns upon which it is anticipated there will be an increased demand owing to the substantial reductions being made in the new tariff.

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35s Lea on cones	94
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90s Lea on cones	1.15-1.20
100s Lea on cones	1.32
110s Lea on cones	1.50
120s Lea on cones	1.80

MILL NEWS

*Utah, Salt Lake City. The proposal of S. W. McClure, secretary of the National Wool Growers' Association, to establish woolen mills in large Western cities, giving as the main inducement the nearness of the wool supply, is not receiving the support that was anticipated and it is believed that the project will not gain much headway.

*Washington, Aberdeen. Definite information of the project to establish a woolen mill in Aberdeen, and the names of the men interested, will not be known for about thirty days. It is reported that a $100,000 company will be organized under the name of the Aberdeen Woolen Mills Company to establish a woolen mill on a site that has been selected.

West Virginia, Princeton. A cotton manufacturer was here recently looking over various sites with a view of establishing a mill in Princeton. It was stated in an interview with the manufacturer that he proposed a mill, if conditions warranted, which would give employment to approximately 500 hands.

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MILL NEWS

South Carolina, Spartanburg. A new product known as Calvert cloth is being manufactured by the Drayton Mills and is being used for men's wear. The cloth, which is named for A. B. Calvert, president and treasurer of the company, is manufactured from fine combed yarn and resembles Bedford cord. It is expected to be a popular fabric for men's light weight suits next summer. No special machinery will be required for the manufacture of this line.

Massachusetts, Worcester. The Queensbury Mills are the lowest bidders on two contracts to supply the United States Army with serges, and it is expected they will receive the orders.

New Jersey, Paterson. Harigazn H. Kurkjian and others have organized a new corporation known as H. H. Kurkjian & Company to manufacture silks and other fabrics with capital stock of $25,000. The principal office is at 20 Governor St.

*New Jersey, Paterson. An announcement is expected shortly from Ashley & Bailey Company as to the date of the sale of their manufacturing properties. Some of the old stockholders wish to withdraw, as noted in previous reports.

New Jersey, Paterson. Krachman & Margolis have moved into the mill at the corner of River and Bridge Sts. in the space formerly occupied by the Louisiana Silk Mill.

New Jersey, Paterson. The H. E. Wilde Warping & Winding Company is a new commission concern just started in the Slater Street Mills, Dale Ave. Their space is not filled up and more machinery will be installed as business warrants it.

New Jersey, Paterson. E. & Z. Van Raalte are reported as having purchased forty building lots in South Paterson on which they expect to erect a new mill, either this autumn or next spring.

New Jersey, Paterson. The Secancas Silk Company, who recently sold their plant in the Highland Mill, have started again under the same name in the mill at River and Bridge Sts.

New York, Albany. The plans being considered by the superintendent of State Prisons, John B. Riley, call for the installation of a cotton yarn plant at Sing Sing or some other prison at a cost of approximately $20,000. Large quantities of yarn are purchased by the State for the manufacture of hosiery and under-clothing at the State Institutions. It was thought at first that a cotton spinning and weaving plant would be established to make sheets and pillow cases, but this has been abandoned and if any extension of the State's textile manufacturing industry is made it will be along the line of a cotton spinning plant.

New York, Cohoes. Reports that the Garner Print Works & Bleachery will establish a branch of the plant at Wappinger's Falls at Cohoes are emphatically denied at the New York office. They state that they have no intention of establishing a plant at Cohoes.

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19 Jewels
Fully Adjusted

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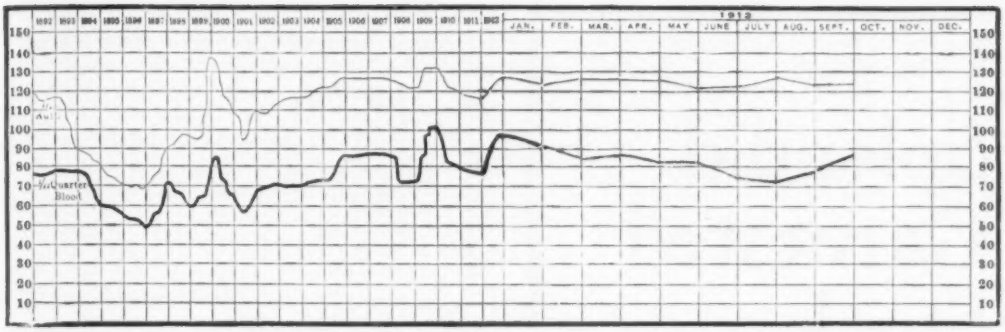

GRAPHIC CHART SHOWING RANGE IN PRICE OF WORSTED YARN.

THE WORSTED YARN MARKET

The spinners of worsted yarns have been fairly well occupied with orders from the weaving trade, with the French spinner having the best of it. The business received by the spinners continues on a hand to mouth basis with urgent requests being made for the prompt delivery of yarns in numbers from single 22s to single 30s, 2/50s, 2/60s and 2/26s oxford mixes.

Prices today remain about the same, although some spinners, in an effort to secure business, are shading prices.

Those spinners who also manufacture knitting yarns state that they are becoming quite busy with orders coming in steadily for immediate delivery for 2/7s up to 2/32s on a basis of 80 cents for 2/7s. These yarns are being sold in colors, double bleaches and oxfords; the most popular colors being crimsons and maroon with the spinners charging 2 1/2 cents for oxfords, the prices charged for colors. Owing to the large volume of business the knitters are using almost every size of yarns, a condition which has not existed for some time. The spinner is being put on his mettle in an effort to make deliveries, as the knitter is short of yarns and must have them soon if he is to fill the orders on his books.

Both the men's wear and dress goods trades are fairly well employed with orders and the prospect of foreign yarns does not seem to interest them to any great extent. While all these yarns are being offered with a view of securing orders after the new tariff goes into effect, domestic yarns have the preference in many cases. The fact of the long delay in securing deliveries of foreign yarns will not, it is said, work to the advantage of the foreign spinner. It is claimed that the domestic spinners will control the situation on mixes, as no mill will place orders for such yarns so far away from the source of supply and trust to getting the shades they desire.

BRADFORD SPUN YARN

2/16 Ingrain (black)	54
2/16 Ingrain (light grey)	55
2/16 Ingrain (white)	56
2/12 to 2/16 low common	66-67½
2/20 to 2/24 low 1/4	70-72½
2/20 to 2/25 1/4 blood	72½-75
2/26 to 2/28 1/4 blood	75-77½
2/32 1/4 blood	75
2/20 3/8 blood	79
2/26 3/8 blood	80-82½
2/32 3/8 blood	82½-84
2/36 3/8 blood	85-87½
2/40 1/2 blood	88-90
2/40 delaine	**1.00-1.05**
2/50 delaine	**1.00-1.02½**
2/40 Australian	**1.22½-1.25**
2/50 Australian	**1.32½-1.35**
2/60 Australian	**1.42½-1.45**
3/28 luster	**95**
3/30 and 3/32 luster	**95-97½**
3/36 luster	**1.10-1.12½**
1/24 worsted and 80s single cotton for raincloths	**1.20-1.25**
1/24 worsted and 120 single cotton for raincloths	**1.05-1.10**

FRENCH SPUN MERINO YARNS—FINE ONE-HALF BLOODS

Standard Grade

1/20 50/50 White Merino Cop	65
1/30 50/50 White Merino Cop	67
1/40 50/50 White Merino Cop	70
1/20 60/40 White Merino Cop	68½
1/30 60/40 White Merino Cop	70½
1/40 60/40 White Merino Cop	73½
1/20 70/30 White Merino Cop	71½
1/30 70/30 White Merino Cop	73½
1/40 70/30 White Merino Cop	77½
1/20 80/20 White Merino Cop	74½
1/30 80/20 White Merino Cop	76½
1/40 80/20 White Merino Cop	81
Sliver and Sanitary Mixes	3c. more
Coning on 1/20	2c. more
Coning on 1/30	3c. more
Coning on 1/40	4c. more

If you want

Splendid Garnetted Stock

made of
Cotton, Wool or Silk,
the finest the market affords, made by men who are "KEEN" after the work—who delight in doing it right—
Then write GRAVES for samples.

Frank B. Graves Co.
34 Arch Street, Albany, N. Y.

FRENCH SPUN YARN

1/20 1/4 blood	70
1/20 high 1/4	72
1/20 3/8	76
1/20 high 3/8	76-78
1/20 1/2 blood	82
1/30 1/2 blood	84
1/40 1/2 blood	86
1/50 delaine	1.00-1.02½
1/40 Australian	1.20-1.22½
1/50 Australian	1.27½-1.30
1/60 Australian	1.40
1/70 Australian	1.52

For two ply Knitting Twist add 5c. additional to above prices.

For two ply weaving yarns add 7 1/2c. additional to above prices.

—:—

KNITTING YARNS

Dyed and Bleached—Bradford System

2/7s straight 1/4 blood	80
2 and 3 ply 10s-15s straight 1/4 blood	80-82½
2 and 3 ply 16s-20s straight 1/4 blood	82½-85
2 and 3 ply 20s-24s straight 1/4 blood	85-87½
2 and 3 ply 24s-28s straight 1/4 blood	87½-90

—:—

WOOLEN AND MERINO YARNS

Woolen spinners today are actively employed in running not only their own spindles, but commission plants as well, in an effort to turn out yarns for the knitters who are buying on a day to day basis in quantities ranging from 500 to 5,000 pounds per order for 2/9 cut to 2/23 cut yarns inclusive, with price at 63 cents for 2/9s and 67 1/2 cents for 2/23s. The orders call for yarns in colors, double bleaches, with crimsons and maroons being the popular colors. No contracts at this time are being placed and spinners do not bother about them as they have as much business as they can handle and in many instances, it is

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Prime Pearl Corn Starch, Soluble Oils and Greases.

Write for prices. You will find them attractive.

said, are refusing orders. All are behind in their deliveries, which is having a tendency to shorten up the supplies in the hands of the knitters who complain that they cannot secure yarns fast enough to make up their orders, a condition which has been brought about by the late buying of the jobbers. Spinners claim to have enough business on hand at the present time to keep them running full up to the end of the year with prices holding stiff and every indication of a still further stiffening as the season advances and the demand for yarns continue.

WOOLEN AND MERINO YARNS

2/20 Light Grey Mixed	80%	20%	57½-60
2/20 Light Grey Mixed	90%	10%	60-62½
2/20 Light Grey All Wool			65-67½
2/20 Colored All Wool			67½-70
2/20 Bleached	80%	20%	70-72½
2/20 Bleached	90%	10%	72½-75
2/20 Bleached All Wool			77½-80
2/23 Colored All Wool			68-70
2/23 Bleached 90/10			72½-75
2/23 Bleached All Wool			77½-80
2/25 Light Grey Mixed All Wool			87½-90
2/25 Bleached All Wool			92½-95

THE RAG AND SHODDY MARKET

The trade in rags and shoddy still continues unsatisfactory. Buyers are operating very conservatively, although there has been some activity in the market for ungraded rags. The foreign demand for American rags has eased up perceptibly. This is taken as an indication of a period of poor business abroad, following the boom that has continued for a number of years. There is little demand for shoddy, the mills not being able to keep their machinery occupied with the orders received. Wool waste is in better demand, particularly for a light stock. The cotton waste market is also in better shape, there being an improved demand for practically all grades of stock. We quote as follows:

SHODDIES AND EXTRACTS

White yarn, best all wool	47-50
White knit, all wool, best fine	30-40
White, knit, No. 2	23-30
Light yarn, extra fine	36-36¼
New pure indigo blue	24-27
Merino	
Fine light, all wool	21½-23½
Medium light, all wool	19½
Fine black, all wool	18½-22½
Fine dark, all wool, best grade	18-20
Medium dark, all wool, No. 2	14½-16½
Red knit stock, strictly all wool	21-25
Red flannel, all wool	20-22
Dark blue for hosiery, strictly all wool, No. 1	20-23½
Dark blue for hosiery, not all wool, No. 2	13-15

NEW WOOLEN RAGS

Fine merchant tailors	7-8½
Choice light colors	7-8½
Browns	13
Blacks	6
Blues	10½
Fine dark	7-12½
Medium dark	4-5½
Serges	
Black	10
Blue	10-11
Flannels	
Very light	18-19
Mixed	10-11
Black	7-8½

SOFTS AND KNIT STOCK

Soft woolens, best	5-6
Old white flannels	11-14½
Old red flannels	10-11
Old blue flannels	3-5
Old plaids	4
White stockings	20-24½
Clear dark hoods	7-8½
Light hood stock	13-14

New York, Walden. A charter has been granted Ludwig Reissman, Inc., with capital stock of $20,000 to manufacture and deal in textile fabrics. The incorporators are Ludwig Reissman, 7 Bay 26th St.; Joseph E. Pearl and Allen H. Remsen, 535 Greene Ave., Brooklyn.

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For many years Cheney Brothers have supplied manufacturers with silk yarns of the very highest quality—spun and reeled, organzines and trams, doubles and singles.
Our facilities are greater than ever, and the seventy-five years of silk manufacturing experience back of

CHENEY SILK YARNS

have enabled us not only to produce the best quality of silk yarns, but to maintain a standard that all manufacturers recognize as *the* standard of the silk-yarn industry.
Your yarn needs, whatever they may be, will be promptly supplied if your order is placed with us. We make a specialty of supplying silk yarns to individual orders.
Quotations and samples on request.

Cheney Silks are of superior quality, and include practically every kind of goods made of silk—whether for dresses, millinery, decoration or upholstery, the haberdasher or manufacturer, man or woman.

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Silk Manufacturers 4th Ave. and 18th St., New York

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Skein Silk Dyeing of every description for every class of textile manufacture.

Hosiery Dye—Boil-off, weighting and dyeing, treated especially to meet the requirements of the hosiery and knitting trade.

Piece Dyeing and Finishing—All silk and silk mixed goods.

Printing—Surface and warp printing.

WORKS:

Paterson, N. J. Dundee Lake, N. J. Allentown, Pa. Williamsport, Pa.

THE SILK MARKET

The silk market is in a very erratic condition, prices advancing one day and declining the next on different grades of silk. Owing to this condition, the manufacturers are not buying in very large quantities, preferring to wait for a decline in the market. It is stated by prominent importers in the silk industry that it is quite probable prices have reached their level, but no one can predict at this time whether this is so or not.

Owing to somewhat easier prices the market in Yokohama, Japan, is reported as being very active. Over a thousand bales was sold in one day recently.

The market is firmer in China. This can be accounted for by the fact that China silks are much called for and the Japan market is high.

Manufacturers in this country are using much raw silk and are watching the market from all sides. Their stocks are much depleted and it is only a question of time when they will be in the market buying in much larger quantities.

The short crop of Italian silk has almost eliminated that market and prices are accordingly rising.

In the European silk districts it is reported that the silk mills are very busy. All these manufacturers are consuming so much of the raw product it will probably have a tendency to keep the market very firm.

The manufacturers in this country are all very busy and are predicting good business conditions in the silk industry for some time to some.

In the dry goods district it is stated that silk and silk mixed goods are selling well. Crepes and crepe effects are still having the call, while poplins, bengalines and all soft finished silk goods are still popular.

The ribbon manufacturers are also very busy on all grades of ribbon, they being used to a great extent in both the dress goods and millinery lines. Fancy ribbons in all colors and widths are having the call and manufacturers in this line are very optimistic as to the future.

The cotton and knitting manufacturers are buying much of the raw product. This is especially true of cotton manufacturers and it is thought by the trade in general that they will use a great deal of the raw product within the next few months. The knitting manufacturers have not been buying so much raw silk of late on account of novelties in this industry not being in as brisk demand.

The silk industry has taken on a very rosy condition and all in the trade seem very optimistic and hopeful that this condition will be a lasting one for many seasons to come.

Following are prices current:

European

Grand Extra Classical Piedmont 12/14 .. 5.20-5.25
Extra Classical Italian 12/14 12/16 ..... 4.95-5.00

VILLA, STEARNS COMPANY
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215-219 FOURTH AVENUE, NEW YORK
'PHONE 2212 STUYVESANT

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For All Purposes

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Prov., R. I., Industrial Trust Bldg.

MILLS:
Brooklyn, N. Y.
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Mills: Bethlehem, Pa., Philadelphia, Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 225 Fourth Ave
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Chicago Office, 206 So. Market St. Boston Office, 78 Chauncy St.

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GOODS FULLY INSURED BY FIRE. PROMPT SERVICE GUARANTEED.

Raw Silk Warping a Specialty.

Classical Italian 13/15 24/26	4.85-4.90
Best No. 1 Italian 13/15 24/26	4.80-4.85

60 days' basis

Japan

Filature Kansai Extra Extra 13/15	4.45-4.47½
Filature Kansai Extra 13/15	4.25-4.30
Filature Shinshu Extra 13/15	4.20-4.25
Filature Kansai Best No. 1 13/15	4.15-4.20
Filature Kansai No. 1 13/15	4.05-4.10
Filature Shinshu No. 1 13/15	4.20-4.25
Rereels No. 1 13/16	4.15-4.20
Rereels No. 1 1/2 13/16	4.10-4.15
Rereels No. 1 1/2-2	4.05-4.10

6 months' basis

China

Canton XXA 14/16	3.95-4.00
Canton XXB 14/16	3.85-3.90
Tsatlee Blue Dragon and Flying Horse	3.50-3.55
Tsatlee Kun Kee Mars No. 1	2.80-2.85
Tussah Filature Eight Cocoon No. 1-2	1.95-2.00

6 months' basis

SPUN SILK

The prices in this industry have advanced ten cents per pound, with no difference in the activity of all the spinners. Business is very brisk in this trade, orders being booked ahead for many months to come. This is all owing probably to the general conditions of the trade, stocks being depleted in many quarters. The prices follow:

60/2	3.50
50/2	3.40
40/2	3.30
30/2	3.15
20/2	3.05
10/2	2.95

ARTIFICIAL SILK

The demand for artificial silk has not been as great as formerly, still the manufacturers report a fairly good business in all lines except the braid trade. Some think that many manufacturers have been waiting for the settlement of the tariff question before buying. There is no change in the prices of this product:

150 Deniers First Quality European	1.95
150 Deniers Second Quality European	1.85
150 Deniers Elberfeld Raw	1.75
150 Deniers Chardonette Natural	1.90

SILK MILL NEWS

*Pennsylvania, Chambersburg. A company has been organized under the name of the Piedmont Silk Company, Inc., with capital stock of $35,000 by Henry T. Fleitmann and H. B. Stanford, the new owners of the Cedar Cliff Silk Mill here. Messrs. Fleitmann and Stanford compose the firm of Fleitmann & Company, 356 Fourth Ave., N. Y., which will sell the product of the mill. One hundred looms will be operated on broad silks commencing October 1. Superintendent Othello Sandbrook will remain in charge.

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YARNS FOR ALL PURPOSES
AMERICAN SILK SPINNING CO., PROVIDENCE, R.I.

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International Correspondence Schools
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SILK MILL NEWS

Connecticut, Mystic. The Mystic Industrial Co., owners of the property occupied by the Rossie Velvet Company, will build an addition to the plant which is to be used for storage purposes. Construction contract has been awarded to Dudley Bindloss.

Massachusetts, Holyoke. A 2-story addition is to be built to the drying room of William Skinner & Sons. The Caspar Ranger Construction Company has the contract.

New Jersey, Passaic. Jackson Bros. expect to move their plant to Paterson and increase the equipment. They have not as yet secured space, but have an option on a loft. This plant was moved here from Paterson some time ago.

New Jersey, Paterson. Abraham Schottland expects to have 64 looms running on broad silks in his new quarters in the new Eastwood Mill by November 15, and will add 16 looms later on when the plant is fully equipped.

*New Jersey, Paterson. The capital stock of H. H. Kurkjian & Company, recently organized to manufacture silk goods, is $50,000 instead of $25,000, as stated in an earlier report. The concern is manufacturing reversible neckties, silk tie goods, and ribbons at 20 Governor St. and will shortly remove into larger quarters and put in more machinery. This change will take place in probably two months. H. H. Kurkjian heads the new concern.

*Pennsylvania, Catasasqua. Architects in Allentown in this city have completed plans and specifications for a 50 by 150-foot two-story addition to the mill of the Wahnetah Silk Co.

*Pennsylvania, Allentown. In about two weeks the large addition being built in Allentown for the Doherty & Wadsworth Company will be completed and machinery will be set up at once. A part of this equipment will be taken out of the Paterson plant and moved to Allentown. This will not affect the operation of the Paterson plant, however, which will continue as heretofore. Broad dress silks are manufactured.

*Pennsylvania, Easton. Work is to be started early in the spring of 1914 on the new mill for the Roehlen-Pittenger Silk Company, manufacturers of broad silks. The present equipment will be moved from the old location when the new mill is completed.

*Pennsylvania, Easton. Alexander Smith, who recently started a commission warping and winding plant at Front and Ferry Sts., expects to add to his present plant in the near future.

Pennsylvania, Philadelphia. Frank Minet, Walker St., near Van Kirk, Wissinoming, commission warper and winder of silk, expects shortly to build a plant. Mr. Minet began business only a short time ago.

*Pennsylvania, Vera Cruz. Twenty broad silk looms have been ordered by the Vera Cruz Silk Company and will be installed in the addition just completed. The enlargement is 40 by 40 feet and makes the mill 120 feet long and 40 feet wide. The total equipment will be 66 looms. M. A. Bitting is superintendent and buyer.

MILL NEWS

*Pennsylvania, Easton. It is expected the large addition to the plant of the Easton Silk Company on which work has just been started will be completed and equipped by December 1. One hundred and fifty looms will be added to the plant for weaving broad silk goods. William R. Haytock is president and buyer; C. Cronemeyer, treasurer, and John Haytock, superintendent. The plant is operated by steam power.

*Pennsylvania, Kane. The Thissen Silk Mfg. Company is at present moving its equipment to the new mill built during the summer and expects to be operating again by October 1 with twice the old capacity. Silk gloves, nets, linings, etc., are manufactured. The company has capital stock of $30,000 and began operations here about two years ago.

Pennsylvania, Nazareth. A number of new looms are being added to the new silk mill recently built here by McCallum & Post of Paterson.

*Alabama, Demopolis. The sale of the Elmore Cotton Mills to B. G. Wilson, an attorney, for $15,000 has been set aside by the referee in bankruptcy who has ordered the property to be resold October 27.

Alabama, Ozark. It is reported that W. D. McNeill of Ozark, and others, will build a 5,000-spindle cotton mill.

*California, Colton. It is reported that Parkenson & Berstrom, a Los Angeles firm of architects, are preparing plans for the projected Olympia Cotton Mills, being promoted by M. W. Durham.

Canada, Ontario, Cobourg. A new dyeing concern has been organized under the name of the Cobourg Dyeing Co., Ltd., with capital stock of $190,000. The incorporators are W. K. Fraser, J. R. L. Starr and C. A. Mostin of Cobourg.

Connecticut, Moodus. The lower mill of the Neptune Twine & Cord Mills has resumed manufacturing after a shutdown to install new machinery and make some repairs.

Connecticut, Windsor Locks. The property formerly occupied by the Windsor Silk Company, which went out of business a year or two ago, has been bought by the George P. Clark Company, manufacturers of trucks.

Georgia, Atlanta. The plant of the International Tape Company will be sold at auction by trustee T. J. Ripley. The company was recently petitioned into bankruptcy.

*Massachusetts, Worcester. Appraisers have been appointed by Charles E. Aldrich, referee in bankruptcy, to appraise the property of the Queensbury Mills, petitioned into bankruptcy several months ago by creditors. They are to make an inventory of all the property for the receivers, who are now running the business for the benefit of creditors. A reorganization is contemplated.

Mexico, Arteaga. Report has it that the mill operated by the Compania Industrial Saltillera, S. A., under the name of Fab. de la Bella Union, with a capital of $337,000, on cotton cloths and yarns, with 202 looms and 6,475 spindles, has been destroyed by revolutionists.

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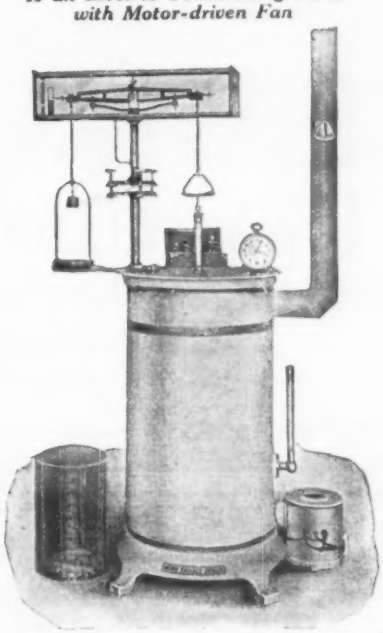

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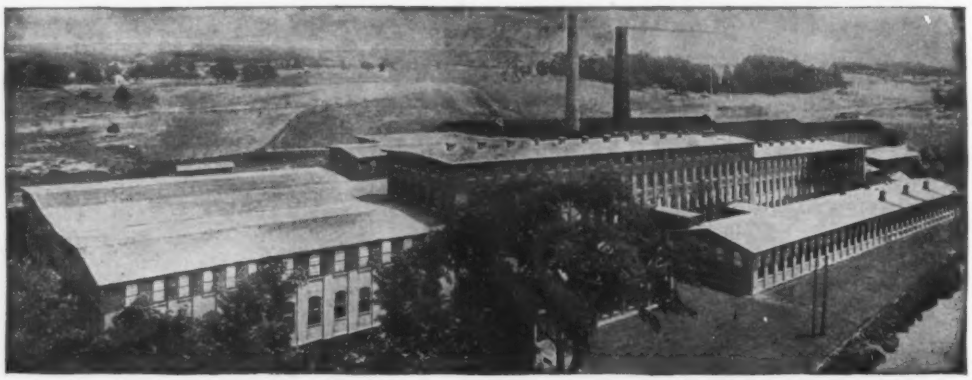

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Tartaric crystals	30-33½

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Acetate of lime, gray, 100 lbs.	2.50-2.60
Alum, lump	1.75-1.90
ground	1.85-2.00
powdered	3.00-3.15
Aqua ammonia, 26°	2-6
Borax	3-5½
Cream tartar, crystals	23½-25
Fuller's earth, powdered, ton	18-20½
Glauber's salt	75-85
Potash, chlorate, crystals	8½-9
powdered	9-14½
carbonate	3-6
Soda, bicarbonate	1.15-1.50
Soda, caustic, domestic, 60 per cent.	1.80-1.91
Sal., American	65½-85½
Vitriol, blue	4.76-5.00
Acetate of soda	4-6½
Acid, picric, best crystals	70-75
tannic, commercial	36-37
Albumen, egg	42-65
blood	23½
Aniline, oil	10½
salt crystals	8-9
Alizarine	15-16
Bichromate of potash, American	7-9½
Bichromate of soda	4-7
Bisulphite of soda	75-1.25
Cutch, bales	5½-8
Dextrine, imported potato	4-7
Divi-divi, ton	33-47

FIRES.

Pennsylvania, Philadelphia. Fire in the 3-story building at Howard and Berks Sts. damaged the plant of the Melrose Spinning Company, owned by Dornan Bros., carpet manufacturers. The loss is about $6,000. Part of the plant has resumed operations and repairs are being made on the damaged portion. Cotton carpet and upholstery yarns are manufactured in the plant of the Melrose Spinning Company. The fire also damaged the plants of Bunkin & Howard and Joseph D. Swoyer & Co., Inc., located in the same building, both engaged in the manufacture of woolen yarns. The total loss of the three concerns, including damage to the building, is estimated at about $25,000.

Pennsylvania, Slatington. The plant of the Slatington Silk Company has been destroyed by fire with loss estimated at $20,000. The insurance is $14,000. The concern does a business of silk throwing on commission.

Rhode Island, Pawtucket. A fire in the mule spinning room of the American Yarn Mfg. Company caused loss of about $4,000. Much damage was caused by water to the machinery and stock in process.

The WM. H. LORIMER'S SONS CO.,

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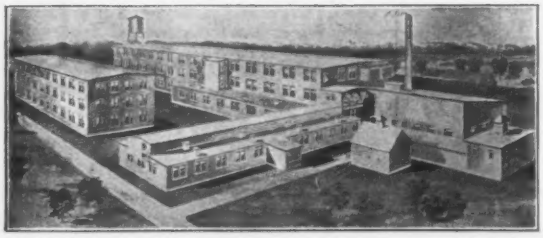

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in skein, and long and short

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Fast Colors a Specialty.

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MILL NEWS.

*Georgia, Cedartown. C. R. Borders is making some progress on his rug plant project. He expects to make rag rugs and cotton ingrains, and is interested in equipment including looms and a raveling machine.

Georgia, Roswell. It is reported a company has been organized here with capital stock of $100,000 with a purpose of increasing to $250,000, to establish a woolen mill.

*Iowa, Des Moines. The addition to be made at the Capital City Woolen Mills, Scheuerman Bros., Inc., will enlarge the clothing manufacturing department where they convert into skirts, dresses and mackinaw coats the production of the woolen mill. The only additional machinery will be sewing machines.

Kansas, Topeka. The action started by Mrs. L. V. H. Nicholson against the Topeka Woolen Mfg. Company has been settled out of court. The woolen machinery will be shipped to a new concern known as the California Woolens Mfg. Company at Long Beach, Cal.

*Massachusetts, Blackington. About 40 looms are being run nights by the Blackington Co., manufacturers of woolens and worsteds for men's wear.

Massachusetts, Boston. A. F. Baker has opened offices at 246 Summer St. and is dealing in tops, noils and wool under the name of A. F. Baker & Company. Mr. Baker withdrew from Baker Bros. & Company about a year ago.

Massachusetts, Fall River. There is some talk of a reorganization of the Barnaby Mfg. Co. President James T. Cummings and Treasurer Edward Barker, both of whom were recently elected, have resigned their offices and have also resigned as members of the board of directors. William H. Pierce has been elected president and George T. Almy, treasurer.

Massachusetts, Fitchburg. The Pitts Mill department of the Star Worsted Company has shut down temporarily on account of the new child labor law, while a readjustment can be made by the concern.

Massachusetts, Holliston. The Darling Woolen Mill Company is operating its Holliston plant on an overtime schedule. An addition was built to this plant several months ago and several new looms installed.

Massachusetts, Lawrence. The American Woolen Company has arranged the hours of work for the young persons in its employ so that discharge will not be necessary under the operation of the new law.

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We advise incorporating in plans the full wording of The Barrett Specification, in order to avoid any misunderstanding.

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Border City Mfg. Co.	...	97½	...
Chace Mills	...	...	...
Charlton Mills	75	80	...
Cornell Mills	...	150	...
Davol Mills	...	90	...
Davis Mills	...	85	...
Flint Mills	92	...	...
Granite Mills	...	102	...
Hargrave Mills	...	50	...
King Philip Mills	...	112	...
Laurel Lake Mills	...	130	...
Lincoln Mfg. Co.	...	95	...
Luther Mfg. Co.	...	155	...
Merchants' Mfg. Co.	...	92½	...
Mechanics' Mills	...	88	...
Narragansett Mills	105	111	...
Osborn Mills	...	104	...
Parker Mills	...	50	...
Pocasset Mfg. Co.	...	100	...
R. Borden Mfg. Co.	117	120	...
Sagamore Mfg. Co.	160	...	...
Seaconnet Mills	...	63	...
Shove Mills	...	...	...
Stafford Mills	...	82	...
Stevens Mfg. Co.	112½	116	...
Tecumseh Mills	100	107	...
Troy C. & W. Mfg.	...	...	...
Union Cot. Mfg. Co.	188	...	...
Wampanoag Mills	...	85	...
Weetamoe Mills	...	87	...

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Appleton Co., Mass.	100	172
Atlantic Cotton Mills, Mass.	100	40½
Bates Carpet Co., Me.	100	252¼
Bigelow Carpet Co., Me.	100	145
Boott Mills	100	98½
Boston Duck Co., Mass.	700	1350
Boston Mfg. Co., Mass.	100	105¼
Cabot Mfg. Co., Me.	100	120
Chicopee Mfg. Co., Mass.	100	90
Continental Mills, Me.	100	75
Dwight Mfg. Co., Me.	500	1060
Edwards Mfg. Co.	100	99
Essex Co., Mass.	100	190
Everett Mills, Mass.	100	110
Fisher Mfg. Co., Mass.	100	125⅛
Franklin Co., Me.	100	205
Great Falls Mfg. Co., N. H.	100	175½
Hamilton Woolen Co., Mass.	100	95
Hamilton Mfg. Co., Mass.	100	80
Hill Mfg. Co., Me.	100	90¼
Jackson Co., N. H.	1000	985
Lancaster Mills, Mass.	100	85
Lawrence Mfg. Co., Mass.	100	150¼
Lockwood Co., Me.	100	103⅜
Lowell Bleachery, Mass.	100	129⅛
Lowell Hosiery, Mass.	100	40
Lyman Mills, Mass.	100	100
Massachusetts Cotton Mills, Ga.	100	93
Massachusetts Cot. Mills, Mass.	100	105
Merrimack Mfg. Co., com., Mass.	100	25
Merrimack Mfg. Co., pfd., Mass.	100	85
Middlesex Co., Mass.	100	60½
Monadnock Mills, N. H.	1000	1000
Nashua Mfg. Co., N. H.	500	550
Naumkeag Steam Cot. Co., Mass.	100	143⅛
Newmarket Mfg. Co., N. H.	100	95
Otis Mfg. Co., Mass.	1000	1852½
Pacific Mills, Mass.	100	108
Pepperell Mfg. Co., N. H.	100	294½
Plymouth Cordage Co., Mass.	100	230
Salmon Falls Mfg. Co., N. H.	300	150
Shaw Stocking Co., Mass.	100	75
Suncook Mills, N. H.	100	20
Thorndyke Mfg. Co., Mass.	1000	1750
Tremont & Suffolk Mills, Mass.	100	110⅜
Waltham Bleachery & Dye Works, Mass.	100	129
York Mfg. Co., Me.	100	85⅛

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	Bid.	Asked.
Abbeville	...	100
American Spinning Co.	155	...
American Spinning Co., pfd.	100	...
Arkwright Mills	...	100
Avondale	120	126
Brogon Cotton Mills (new series)	...	81
Brookside	...	112
Cannon	150	...
Cabarrus	150	...
Chadwick-Hoskins	...	90
Chadwick-Hoskins, pfd.	...	101
Chiquola Cotton Mills, pfd.	80	...
Clifton, com.	80	...
Clifton, pfd.	96	100
Cliffside	190	...
Clinton	...	120
Columbus Manufacturing Co.	...	85
Darlington	75	83½
Drayton	...	90
Erwin, pfd.	105	...
Easley	...	185
Exposition	...	210
Florence	125	...
Gaffney Manufacturing Co.	...	76
Gluck	49	100
Graniteville, S. C.	140	152
Grendle	...	96
Glenwood	...	150
Highland Park	186	200
Highland Park, pfd.	...	102
Hartsville	175	195
Hartsville, pfd.	...	100
Henrietta Mills	...	141
Inman, com.	...	108
Inman, pfd.	...	100
J. P. King Manufacturing Co.	77½	79
Kesler	145	165
Lancaster Cotton Mills	130	...
Lancaster Cotton Mills, pfd.	96	...
Lanet	...	112
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Parker Mills, com.	15	20
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Patterson	129	...
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Piedmont Manufacturing Co.	150	167
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Poe, W. F., Manufacturing Co.	...	105
Riverside Manufacturing Co.	...	78
Roanoke Mills	...	155
Saxon	114	...
Spartan	107	...
Toxaway	...	78
Union Buffalo, first pfd.	34	51
Union Buffalo, second pfd.	...	10
Warren Mfg. Co., com.	78	...
Warren Mfg. Co., pfd.	...	107
Washington Mills	...	20
Washington Mills, pfd.	...	100
Woodside Mills Co., com.	40	...
Woodside Mills Co., pfd.	34	85
Woodside Mills Co., guar.	...	101
Watts	...	85
Williamson	...	125
Ware Shoals	75	80
Whitney	110	120
Wiscasset	135	...
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	Bid.	Asked.
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Beacon Mfg. Co., com.	102½	...
Beacon Mfg. Co., pfd.	...	115
Booth Mfg. Co., com.	...	35
Booth Mfg. Co., pfd.	50	...
Bristol Mfg. Co.	65	...
Butler Mfg. Co.	...	110
City Mfg. Co.	90	...
Dartmouth Mfg. Co., com.	...	215
Dartmouth Mfg. Co., pfd.	98	...
Gosnold Mfg. Co., pfd.	85	88
Grinnell Mfg. Co.	150	...
Holmes Mfg. Co., com.	95	100
Holmes Mfg. Co., pfd.	99	...
Kilburn	110	120
Manomet	...	115
Nashawena Mills	63	65
N. B. Cotton Mills Co., com.	100	...
N. B. Cotton Mills Co., pfd.	...	97½
Nonquitt Spinning Co.	...	87½
Page Mill	77½	80
Pierce Mill	300	325
Pierce Bros., Ltd.	100	...
Potomska Mills	108	...
Quissett Mills	...	92½
Quissett Mills, pfd.	...	100
Sharp Mfg. Co., com.	...	85
Sharp Mfg. Co., pfd.	99	...

Soule	80	...
Taber Mill	...	100
Wamsutta Mills	119	...
Whitman Mills	120	...

MILL NEWS.

*Missouri, Kansas City. The wool pullery equipped at the Kansas City packing plant of Armour & Company opened this week. A 5-story building has been remodeled and fitted up at an expense of $100,000.

*New Hampshire, Milford. There is practically no damage in the plant of the Summers Linen Company following the partial flooding of the mill on account of the automatic sprinkler system being out of order.

New Hampshire, Somersworth. The Great Falls Woolen Company has resumed manufacturing after a brief shut down partly for repairs and partly because of the scarcity of water which was held back by the Great Falls Mfg. Company making repairs to its dam.

Massachusetts, Methuen. A new corporation has been organized under the name of the Colonial Woolen Mills by Alfred C. Gaunt, president, and Frank W. McLanathan, treasurer and clerk. The authorized capital stock is $50,000. This new corporation takes over the mail order business which was conducted by the old Tremont Worsted Mills, which for the past four or five years sold some of its product direct to jobbers and tailors from samples sent out by mail. The new corporation does not affect the Merrimac Mills, organized by Mr. Gaunt when he resigned from the Tremont Worsted Mills.

Massachusetts, Monson. The mill of Ricketts & Shaw is closed for about ten days while necessary repairs are being made.

Massachusetts, North Adams. The new concern of Waterhouse & Waterhouse, recently organized, succeeds Waterhouse & Howard, Theodore Howard retiring. The Waterhouse Worsted Company will continue as selling agents. The mill at present is shut down.

*Massachusetts, Smith's. The Swift River Mill, which was closed for repairs, has resumed manufacturing. The plant is running full time operating 8 sets and 33 looms on all-wool fancy cassimeres.

Massachusetts, West Warren. Two hundred looms which have been in operation in the weave room of No. 3 mill of the Warren Cotton Mills are being moved to the new weave shed recently constructed.

Massachusetts, Worcester. The explosion in No. 2 mill of M. J. Whittall of a steam cylinder on a drying machine partially wrecked the building and caused heavy damage. No definite estimate can be made as to the loss at the present time. No one was injured. Repairs are now being made and work at the plant will go along as usual the coming week.

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DAY LITE

Mill White

Turns darkness into light, which means maximum efficiency from your mill. It stays white where others turn yellow. It saves artificial light bills. It will not crack nor scale, and is not affected by any ordinary vibration, expansion or contraction.

Write for free sample and booklet.

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Interruption of Production

is recognized by textile mill operators as the most costly element of repairs.

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are so liberally designed and so sturdily constructed that they will operate for years without need of repairs providing they are properly supplied with oil while in service.

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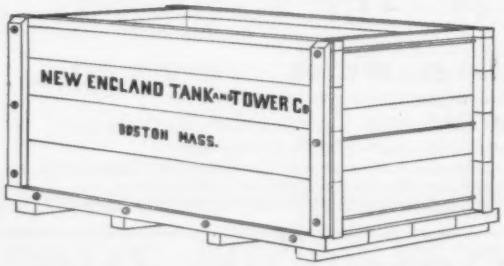

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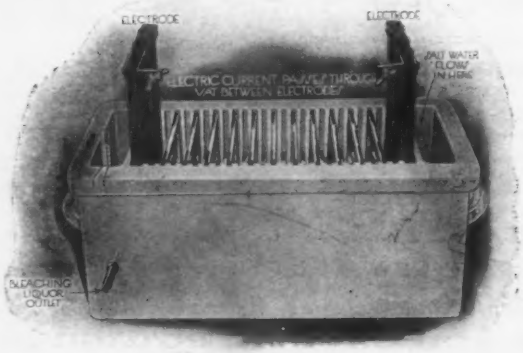

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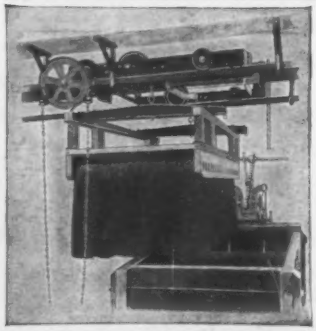

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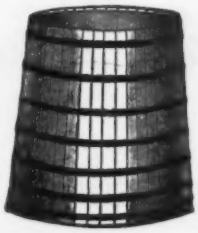

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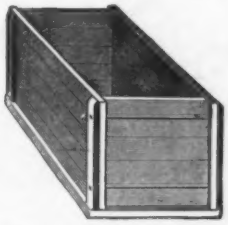

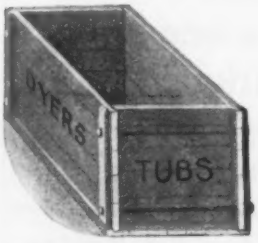

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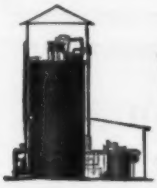

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FOR BOILER FEED AND ALL INDUSTRIAL USES

WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

Norwood Norwood

Mechanical Filters

GRAVITY AND PRESSURE TYPES

Cleanse Water—Save Losses—Promote Business Success

Norwood Filters are sold with a Guarantee which can be given because every one is built to suit location and condition.

We don't sell you any old filter but investigate first.
Then we build a filter to suit your requirements.

Write For Our Experts | **Norwood Engineering Co.** Florence, Mass. | Expert Advice Free of Cost

Trucks for Yarn Dryers and Dye Houses

that are designed and built with a wide and comprehensive knowledge of the actual every day requirements in these lines. In trucks as in other lines it pays to buy the best. *Bailey's trucks are the kind you need.* Once tried always used. Tell me your needs and I will tell you about the truck that meets them.

Frank Bailey, Manufacturer of Yarn Drying Machinery, Dry Poles, Dye Sticks and Fans, Works at Braddock. P. O. Address, Cedar Brook, Camden Co., N. J.

TANKS

that are built for long service

TANKS

that meet every textile requirement

BLEACHERS!

A new season is coming.
It's going to be a strong white one—
Peroxide-white!
If you are not posted on Peroxide bleaching consult us. Send gray or grease samples, which we return bleached with practical recipes. No charge.
Don't plead: "I didn't know"—
We have shouted it for years!

THE ROESSLER & HASSLACHER CHEMICAL CO.
NEW YORK, N. Y.

Farbwerke-Hoechst Company

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H. A. METZ & CO.

Aniline and Alizarine Colors, Dyestuffs and Chemicals

Sole Licensees and Importers of the Products of
FARBWERKE, vormals MEISTER LUCIUS & BRUENING,
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FRIEDBERGER-AARON MFG. CO.

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Braids and Edgings

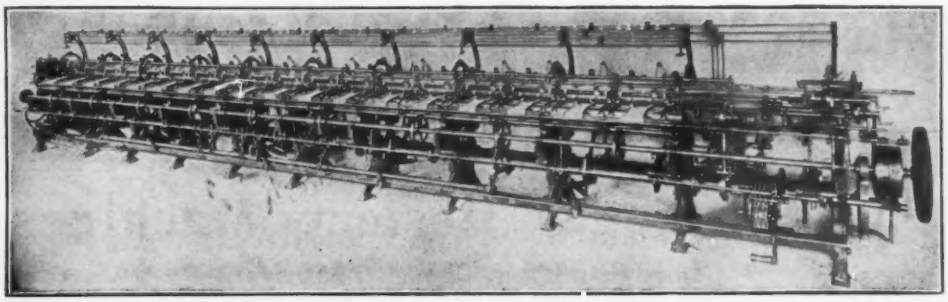
FOR TRIMMING

Ladies' Ribbed Underwear

OUR MOTTO: Correct Goods
Right Prices
Prompt Deliveries

Mills: Wayne Junction, Philadelphia

Post Office Address,
Logan Station, Philadelphia



Full Fashioned Hosiery Machines

MANUFACTURED BY

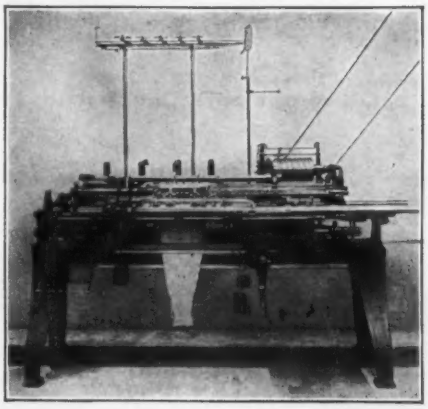
David Richter, Inc., Chemnitz, Saxony

Built in all gauges, any number of sections, and with any attachments desired.
Best constructed, easiest running and most productive machines on the market.
LACE MACHINES, system "Gothrough," **NETTING MACHINES,** system "Double Locker," **LACE CURTAIN MACHINES.**

Dubied Knitting Machines

BUILT BY

Edward Dubied & Co., Couvet, Switzerland



The most perfect knitting machines that skill and experience can produce.

Designed for the highest possible production and the greatest endurance.

Full automatic, semi-automatic and **hand machines,** for **links** and **links,** (pearl stitch) flat and tubular **automatic widening, jacquard, shaker, accordion bias neckties.**

Machines can be seen in operation.

Complete stock of supplies carried in New York. All parts interchangeable.

Kuechenmeister winders, Standard overseamers, whipstitch overseamers with automatic trimming attachment.

Write for our illustrated Book "A"

E. O. SPINDLER, Agent

350 Broadway Rooms 520-24 New York, N. Y.

THE GROSSER KNITTING MACHINE CO.

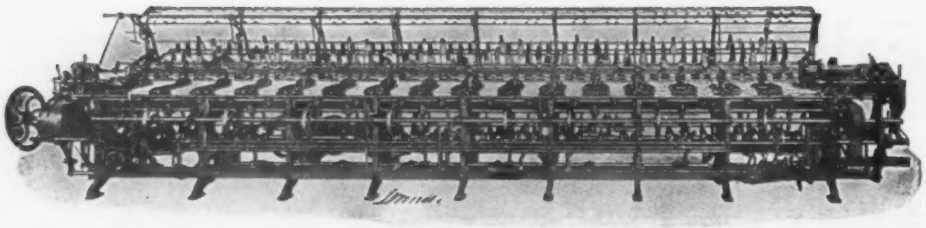
MAX NYDEGGER

Wool Exchange, 260 W. Broadway, New York

ALL SPECIAL MACHINES FOR ANY ARTICLE THAT IS KNIT

Full Fashioned Hosiery Machines

System **G. Hilscher, Chemnitz, Saxony**

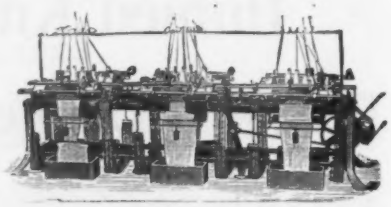


16 Section "COTTON HILSCHER" Machine for Full Fashioned Hosiery, Silk, Cotton, Wool, etc.

Gold Medal, Paris, 1900 — Numerous Patents Covering Special Improvements

GROSSER Flat Knitting Machines

For HAND Power or FULLY AUTOMATIC Power MACHINES. Most productive and best machines for Sweaters, Jackets, Blouses, Wool Hosiery, Gloves, Mittens, Sporting Goods in Plain, Fancy and Jacquard Work, Shaker Articles, etc. Large stock on hand. Power Machines to be seen in operation.



CIRCULAR FRENCH FRAMES

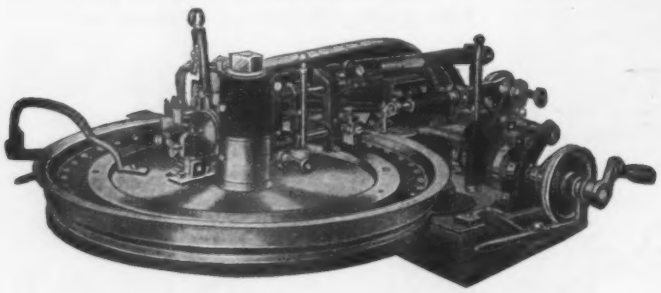
C. Terrot Söhne, Cannstatt, Würt, famous builders of the best Circular Frame for Finest Underwear, Fleece Linings, Gloves, Special á-jour (openwork) Fabrics, etc.

RASHEL MACHINES [Double Rib Warp Knitting Machines.]

For Fancy Goods in largest variety, Shawls, Capes, Caps, Borders, Fringes, Lace Work, etc., in silk, wool, cotton.

THE LOOPER THAT LOOPS!

Two thread lock stitch machine with reliable trimmer and raveller producing *indestructible, flat elastic seam.* No hosiery or underwear plant up to date without this machine.



DIAMOND OVERSEAMERS

for all classes of selvage goods, Full Fashioned Hosiery, Underwear, etc.

FINISHING MACHINES

for Knit Goods of all styles.

WINDERS

for finest yarns.

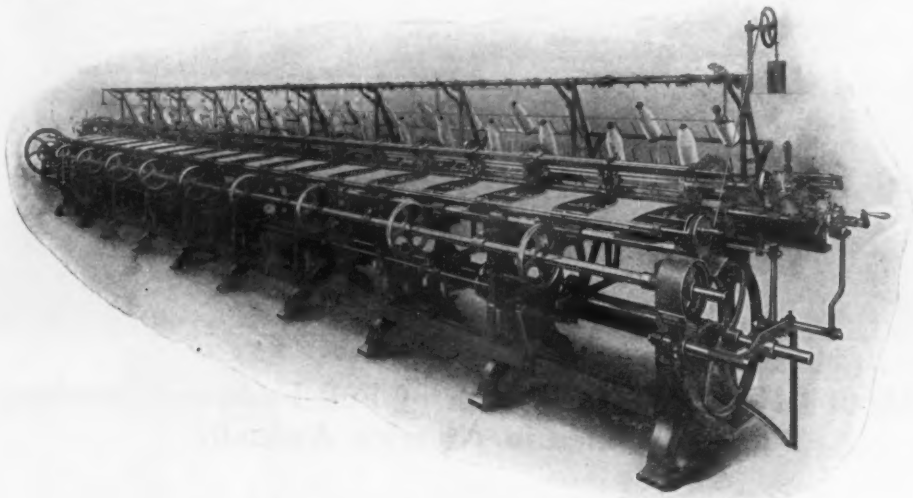
Information, Samples and Specifications at Your Disposition.

Full Fashioned Hosiery Machines

BUILT BY

Schubert & Salzer Maschinenfabrik and Branch Works H. Alban Ludwig, Chemnitz, Germany

Largest Manufacturers of All Classes of Hosiery Machines



Since the acquisition of the Ludwig Plant, Schubert & Salzer have continued the construction of Full Fashioned Hosiery Machines in both systems, the Ludwig with divided narrowing tackle, movable knocking-over bars, etc., and both types with various special features and all the practical attachments known to the trade. Built in all gauges from 14 to 34 needles to the inch, from 12 to 24 sections.

Best Constructed and Most Productive Machines on the Market

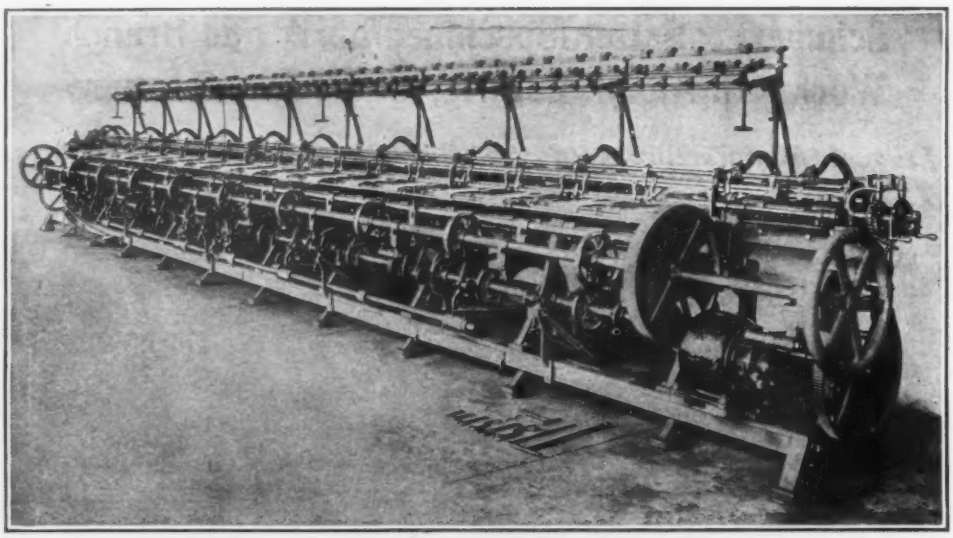
REFERENCES:

All the leading manufacturers of full-fashioned hosiery in this country.

AMERICAN REPRESENTATIVE:

OTTO WALTHER, 507 Bourse, Philadelphia

GET MORE OF THIS $10,000,000.



About $10,000,000.00 Worth of Full Fashioned Stockings Are Made in America Annually

YOU can get a bigger share of these millions by making full fashioned hosiery on American Full Fashioned Hosiery Machines—built in Reading, Pa.

These machines make stockings that fit perfectly—the kind that will help you meet the growing demand for full fashioned hosiery.

One after the other of the leading *Full Fashioned manufacturers* are installing these machines.

If you are thinking of making Full Fashioned goods write us.

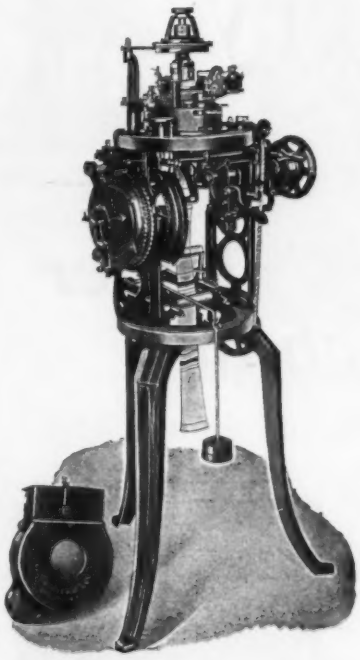
As our success depends upon your success all we ask is a chance to prove that we can help you.

TEXTILE MACHINE WORKS

READING, PENNA.

A Still Newer Necktie Machine

For Diagonal Patterns



AMONG our other new features are a body machine with revolving cams, instead of revolving cylinder and dial.

This machine is equipped with the dogless attachment, thus eliminating the many troubles due to the use of dogs with which all other American rib machines have to contend.

In addition there is a new friction drive which facilitates starting the machine from either front or back.

Also an improved yarn guide and latch guard.

Wildman Mfg. Co.

Established 1889

Norristown, Pa.

Trade Mark

CHARLES COOPER

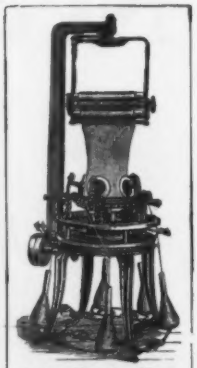
BENNINGTON, VERMONT.

MANUFACTURER OF

Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder.

Circular Spring Needle Rib Top Machine.



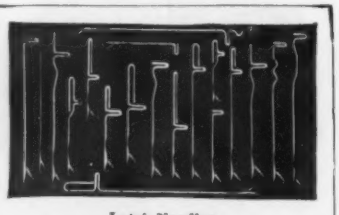
Spring Needle Circular Plain Body Machine.

Spring Needle Cylinder Rib-Top Machines

For making Cuffs, Drawer Bottoms and Shirt Borders.

Spring Needles.

Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, Etc.



Latch Needles.

COLLARETTE ATTACHMENT.

AMERICAN REPRESENTATIVE.

G. H. ROGERS,
838 Lancaster St., Albany, N. Y.

EUROPEAN REPRESENTATIVE.

FELIX LEDERER.
Ix/4 Schubertgasse, Nr. 22, Vienna, Austria.

Union Special Pointed Collarette

Collarette strip prepared in cutting department

No trimmers to stretch neck on sewing machines

Fold in Collarette strip indicates to operator center of strip, insuring correct size of neck

Novel device to fold collarette strip

Operation easily accomplished

Novel manner of preparing collarette strip

Different sizes of neck easily obtained in cutting

Union Special Machine Company

BRANCHES
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HOME OFFICE AND FACTORY
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FOR MAKERS
OF TEXTILE AND KNITTING MACHINERY

HIGH GRADE COLD FINISHED STEELS

To Temper or Not to Temper. Large and Complete Stock for Prompt Shipment

SEAMLESS STEEL TUBING

Bars, Strips, Sheets, Rods and Wires. Close Forged Cylinder Rings and Dials.
Twist Drills. Send for Catalogue "D." Milling Cutters.

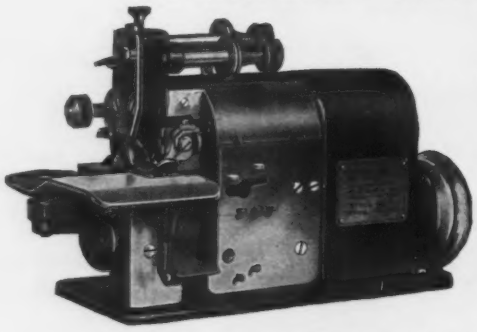
FIELD & COMPANY, Inc.

116 North 7th Street Philadelphia, Pa.

The Merrow

FAST
DURABLE
Light Running

High Speed Overseaming, Overedging and Shell Stitch Machines are



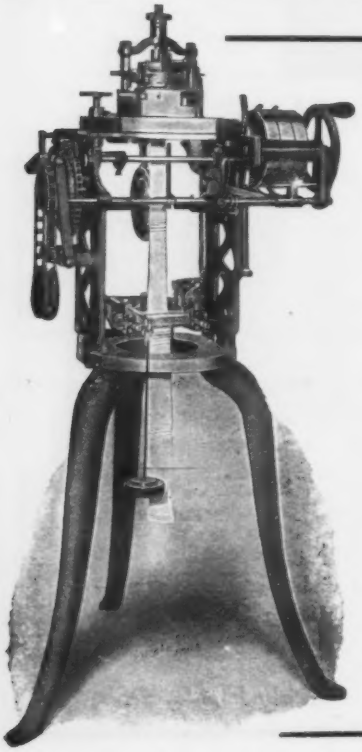
OUR CLASS 60 MACHINES for Trimming and Overseaming in one Operation produce the strongest, best Seams and do it with the greatest economy.

USE STYLE 18 for Horse Blankets.
STYLE 17 B or 22 for Bed Blankets.
STYLE 35 E SHELL, for Necks and Fronts of Rib Goods, produces the most showy, substantial finish.

Send for Catalogue and Samples.

THE MERROW MACHINE CO. HARTFORD, CONN.

Knickerbocker Building, Sixth and Arch Sts., Phila, 467 Broadway, cor. Grand St., N.Y.
815 Van Buren St., Chicago, Ill. 1019 E. Baltimore St., Baltimore, Md.



H. BRINTON COMPANY

213-217 Race Street, Philadelphia, Pa.

BUILDERS OF

Circular Knitting Machinery

of every kind for every purpose

HOSIERY RIBBERS

with Splicing, Striping, Two-speed, Selvage Welt and French Welt Attachments.

Full Automatic Hosiery Footers

BODY MACHINES, SLEEVERS, etc.

for Underwear, Sweaters, Toques, etc.

NECKTIE MACHINES

for making all kinds of tubular knitted scarfs.
Write for catalog, prices and samples.

THE

Textile Exhibitors Association, Inc.

Announces to the

Textile Manufacturing World

The Fourth National

Textile Exhibition

MECHANICS BUILDING, - BOSTON, MASS.

April 27 to May 2, 1914

POWER SHOW DEPARTMENT

Under the auspices of the

New England Association of Commercial Engineers

Also

Departments for Mill Construction and Finished Products

During the Exhibition Meetings of Associations of Textile Interests will be held.

Address all communications to

CHESTER I. CAMPBELL, Secy., 5 Park Square, Boston, Mass.

MERCERIZED YARNS

Dyers of

INDANTHRENE COLORS—GUARANTEED FADELESS

to

LIGHT—WASHING—BLEACHING

Aberfoyle

Manufacturing Company

CHESTER, PA.

THE MOST COMPLETE LINE OF

Sweater Coat Machines

Automatic Racking Machines with or without striping attachments.
Herring Bone Stitch Coat Machines.
Plain Sweater Coat Machines.
Pineapple Stitch Sweater Machines.
Jersey Sweater Machines.
Plain Binding Machines.
Rotary Jacquard Binding Machines.

FOR INFORMATION, ADDRESS

STAFFORD & HOLT,

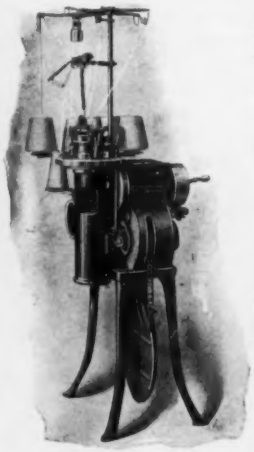
LITTLE FALLS, · NEW YORK, U. S. A.

A New System of Machinery for Producing Seamless Hosiery

Scott & Williams Model B

(Incorporated)

Replacing Former Model B



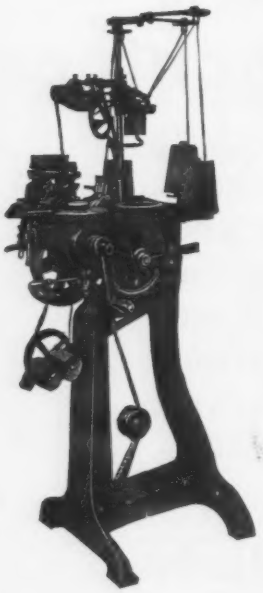
Five Yarn Changes.
Sectional slackening prior to the heavy yarn changes, thereby preventing cutting and waste.
Fabric also slackened where high splicing yarn is inserted, thus insuring narrow ankle and foot.
For transfer work less moves than any other machine on the market.

Scott & Williams Model F

(Incorporated)

The most comprehensive machine ever offered to the trade.
Makes women's hose with integral welt—no sewing necessary.
Or will make women's hose with selvage top, using any kind of yarn from silk to carded cotton.
Makes half hose without a transfer.
All dropped from the machine—looping alone required.
Anti-run-back course preventing ravelling from garter tears and other causes.
This machine may also be used for making string work, or half hose transferred in the old fashioned way.

Philadelphia **SCOTT & WILLIAMS, Inc., 88 Pearl Street, Boston, Mass.** Utica



THE INVINCIBLE

Full Automatic Knitter

The machine that stands for

QUALITY OF PRODUCT

Jenckes Knitting Machine Co.

SUCCESSOR TO
KNITTING MACHINE DEPARTMENT OF
E. JENCKES MFG. CO.

Pawtucket, R. I.

Philadelphia Show Rooms, 1211-1217 Filbert Street

The Reece Button-Hole Machine

For Cutting and Stitching Straight Double-Barred Buttonholes

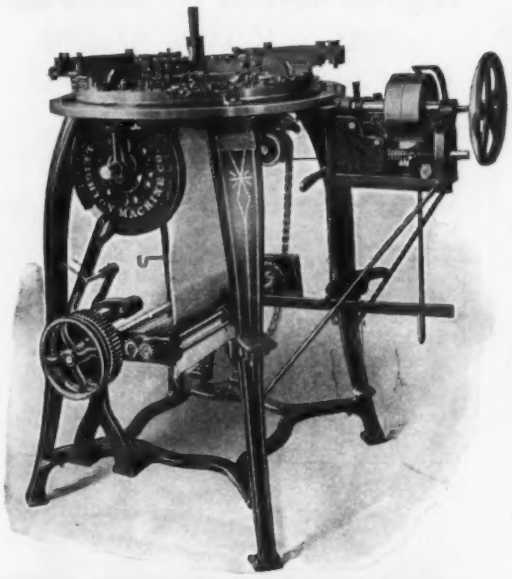
This machine is designed for cutting and stitching straight double-barred buttonholes without eyelets, from 1/8 of an inch in length up to 1 inch, in knit goods, shirts, shirtbands, collars, cuffs, etc., also on knit goods of all kinds. It is superior to all other machines, as it is the *only single thread* buttonhole machine on the market doing away with the bobbin or under thread, thereby making a great saving in the use of thread, and *it will produce more than double the quantity of work of any other machine*, thus saving the employment of an extra operator and the space of an extra machine. The quality of the work produced is superior to any other buttonhole, from the fact that the stitch is elastic, which is an important factor in knit goods. This machine is automatic in all its movements, and is an easy machine to handle, and does not require the services of a skilled operator, no cutting or pulling of the thread required, and when the buttonhole comes from the machine, it is finished in every respect and does not require to be trimmed or cut. The length of hole required can be obtained by simply turning a screw.

The machine is made of hardened steel drop forgings, thus reducing the breaking and wearing of parts to a minimum. *Samples of work and terms sent on application.*

THE REECE BUTTON-HOLE MACHINE CO.

Office and Factory - 500 to 514 Harrison Avenue, Boston, Mass.

Leighton Improved Circular Knitting Machines



FOR SWEATER COATS

Give Good Production and Excellent Quality

IN

Automatic Racked Fancy

OR

Plain Stitches

On Wool, Worsted or Cotton Plated

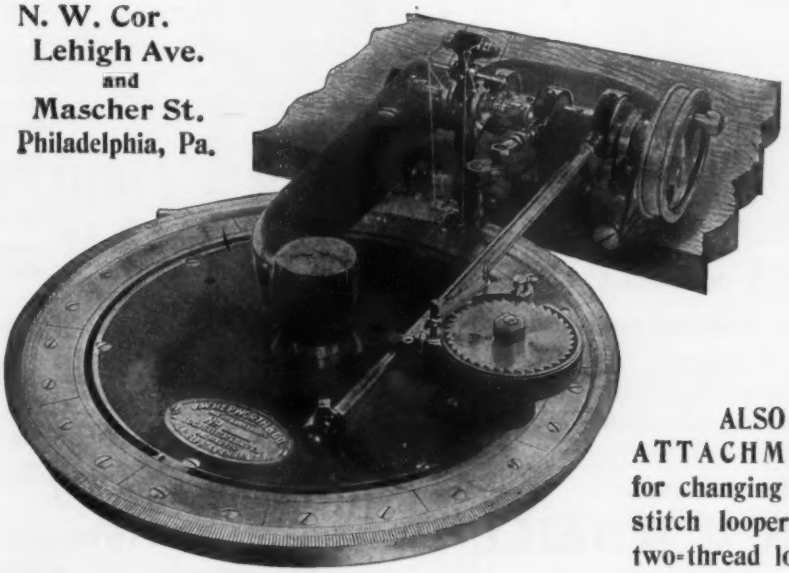
We also Build Jersey or Ribbed Underwear Machines, 4 to 16 Feeds

Leighton Machine Company

Manchester, N. H.

John W. Hepworth & Company

N. W. Cor.
Lehigh Ave.
and
Mascher St.
Philadelphia, Pa.



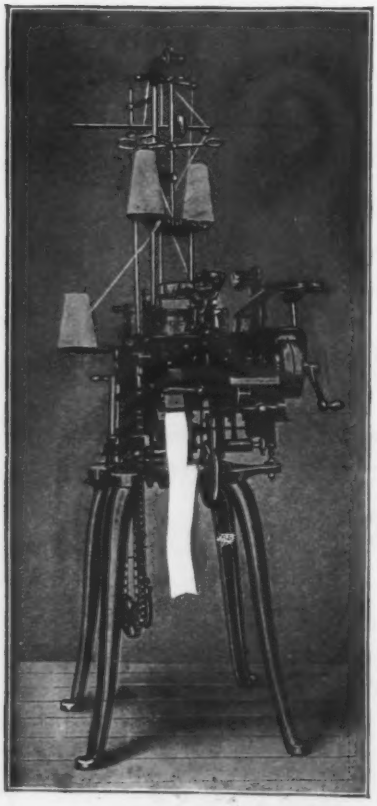
Makers of Two Thread Elastic Lock Stitch Loopers

ALSO ATTACHMENTS for changing our single stitch loopers into the two-thread loopers.

PAXTON & O'NEILL

Full Automatic

Yarn Changers and Platers



Easy Transfer

Accurate Measuring Device

Produce Finest Fabric Made On Any Latch Needle Machine

FOR LADIES or HALF HOSE

Makes Ladies' Hose with Garter Top.
No Ravel;
Silk, Plated, or Mercerized Leg.
High Splice, Double Sole, with Advanced Toe, Linen or Mercerized Heel and Toe.

PAXTON & O'NEILL

537-41 North Third Street, Philadelphia

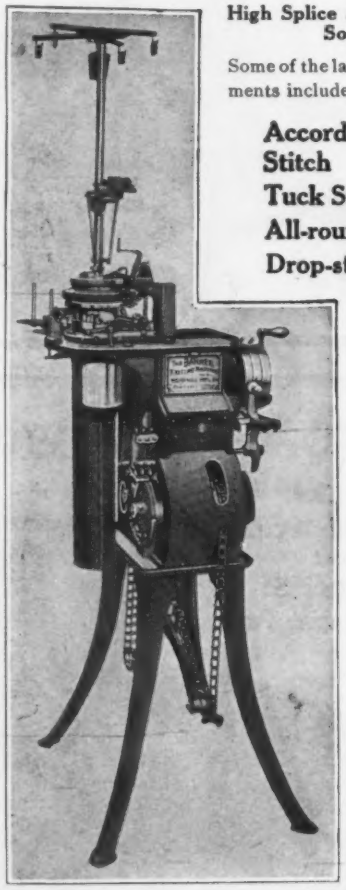
"THE BANNER"
HEMPHILL'S LATEST

FULL AUTOMATIC MACHINE

The First Practical Revolving Cylinder Machine on the Market

Built for either plain or split foot work, single or double feed. Adapted to manufacture hose with linen or mercerized heel or toe.

Also for Plaited Goods, Silk and String Work



High Splice and Double Sole

Some of the latest improvements include:

Accordion Stitch
Tuck Stitch
All-round Drop-stitch

These Improvements are fully AUTOMATIC

Largest Production

More Yarn Changes

Highest Speed

Simplest

Least Repairs

Over 2500 sold and delivered the first half of the present year

PRODUCES A SUPERIOR QUALITY OF WORK

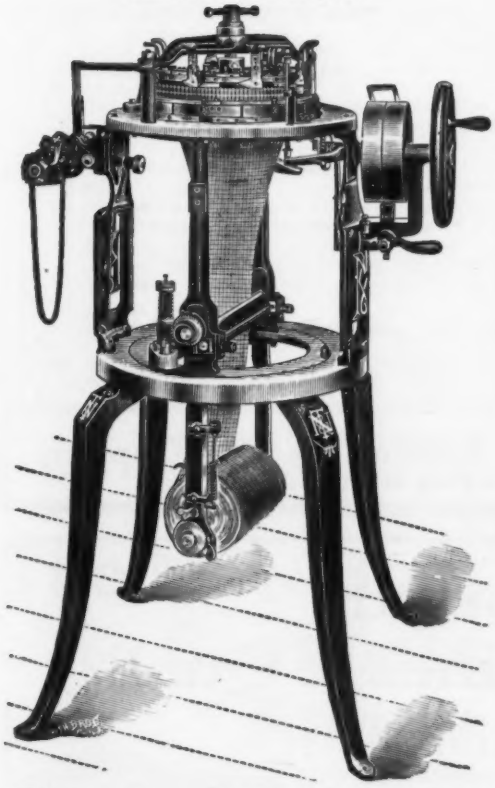
Hemphill Mfg. Co.

131 Clay Street - PAWTUCKET, R. I.

Average Production 100 Machines a Week

NYE & TREDICK CO.

718-720 Cherry Street
PHILADELPHIA, PA.



Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. Correct Construction, Excellence and Durability.

LATEST IMPROVEMENTS

Quality of Fabrics and Production
UNEXCELLED

NYE & TREDICK CO.

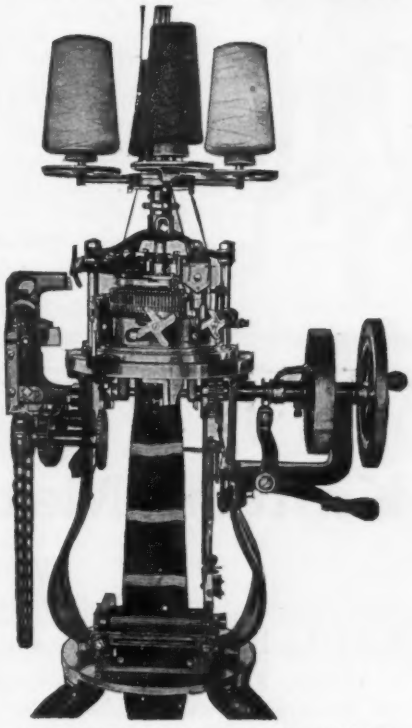
1913

CRANE MFG. CO.

Established 1870 LAKEPORT, N. H. Incorporated 1890

Spring and Latch Needle Machines

for Both Rib and Plain Work
Economically Producing
A GREAT VARIETY OF FABRICS



IMPROVED AUTOMATIC TOQUE MACHINE

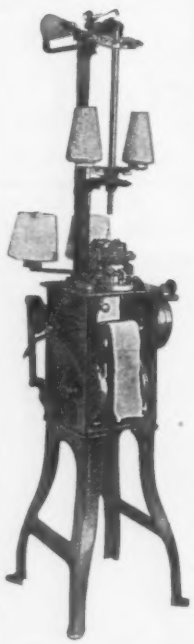
Made in sizes from 5″ to 7″ inclusive, of any desired gauge; these measurements being back to back of cylinder needles.

These machines are built in a thorough and workmanlike manner and are second to none in the market.

The Crawford stop-motion is applied when requested

SOME CRANE FEATURES.

Patent removable hardened Wing Burr Wheels.
Patent Thread Stop Motion can be fitted to 30 in. and 40 in. frames and are specially adapted for making fine Jersey Cloth and Stockinet.
Our flat machine is adapted for knitting collarettes.



More Production Increasing Points of The A. N. Ames Automatic Knitting Machine

Fifteen good reasons for buying the new "Five-In-One" Automatic Knitter have been given in three preceding issues of the Textile World Record.

But there are still more reasons. Here are points 16 to 20:

16. The Sinker Cam Ring—the only one of its kind—is of the open type. Therefore the Sinkers can be seen in action. If a Sinker is broken it will not tie up the machine.

17. The Sinker Ring will not cause the trouble found in other machines as it cannot rise and cause uneven knitting. Both the Sinker Ring and the Needle Cylinder are self-cleaning.

18. Adjustments for regulating all stitches are entirely independent of one another and cannot conflict.

19. There is no yarn to fly around and catch on parts of the machine as the bobbins are stationary when reciprocating, as in knitting the heel and toe.

20. The greater part of the revolving stand is done away with because the Take-up is placed below the bobbins, preventing yarn or bobbins from being caught.

Twenty of the twenty-five big, worth-while features of the A. N. Ames Automatic Knitting Machine have been presented in this and three preceeding issues of this paper. Look them over and see the other five that will appear next month. But better still send now for full details.

The A. N. Ames Knitting Machine Company
Factory and Main Office, Main St., Franklin, N. H.

Imported Knitting Machines of Quality

SPECIALTIES

Karl Lieberknecht, Oberlungwitz, Saxony

FULL FASHIONED MACHINES. "System Cotton" for plain and ribbed Hosiery, Underwear, Gloves and Neckties.

RIB MACHINES, high speed, for Rib Tops, Neckties, Hosiery in plain, striped and accordion effects.

WARP MACHINES (120 courses per minute) for Tricot Fabrics.

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WARP MACHINES, for Elastic Hat Bands, Mourning Bands, Shawls and Scarfs.

JACQUARD WARP MACHINES, for Veilings, Laces, Shawls, Insertions, etc.

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A RARE OPPORTUNITY TO BUY

10 Lamb & Grosser Sweater Machines.
3 Large Crawford Hollow Plate Presses.
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54 Standard "B" Knitters for sizes.
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2 Complete Hosiery Plants.
1 Boomer & Boshert Cold Press.
1 Crane Style Collarette Machine 20", 16 to in.
1 Rotary Fire Pump. 3 Small Pumps.
2 Toque Machines.
4 Hosiery Dryers.
14 Cornely Hosiery Embroidery Machines.
500 Dozen Hosiery Shaping Boards.
1 Caligraph Typewriter.
1 Complete Plant for Mfg. Hosiery
1 ⅙ h. p. Electric Motor.
1 Singer Nat. Button-hole Machine.
500 Payne Winder Bobbins.
100 ¾ Aut. Knitters, various makes and sizes.
1 Payne 40 Spindle Skein Winder.
1 Abel 36 Spindle Cop Winder.
1 Union Special Overedge, Style 15.400.
4 Climax High Speed Motions for Ribbers.
1 Underwear Mangle.
Lot Electric Stop Motions for flat Machines.
1 Merrow No. 60.
1 Crawford 17 Plate Press.
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5 Band Folding and Cutting Machines.
1 Curtis & Marble Napper, 66".
30 Sweater Coat Machines various styles.
8 Jones Fleecers, 24x36".
1 Underwear Knitting Plant.
2 Singeing Machines.
1 Hosiery Printing Press.
4 Hosiery Lever Presses.
42 Union Spec. Sewing Machines, various styles
50 Loopers and Seamers, all makes.
60 Ribbed Underwear Machines.
100 Hosiery Ribbers and Sleevers.

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Do you want the biggest production with the least menders, for the least money? If so, write to the Boss Knitting Machine Works for their circular with full directions. There is no cylinder to be handled. We use only one cylinder and transfer device for half hose or ladies' hose. This machine beats them all. Has no equal for simplicity and durability. Makes 300 revolutions per minute. Built in sizes from 2¼ to 5½; from 40 to 224 needles. Automatic in heel and toe. It is the strongest built knitter on earth.

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PUT ON TO STAY ON

No bobbins to wind. Will sew all buttons with any thread. No threads to trim. Saves 90% of the needle breakage.

The Elastic Stitch Button Sewing Machine

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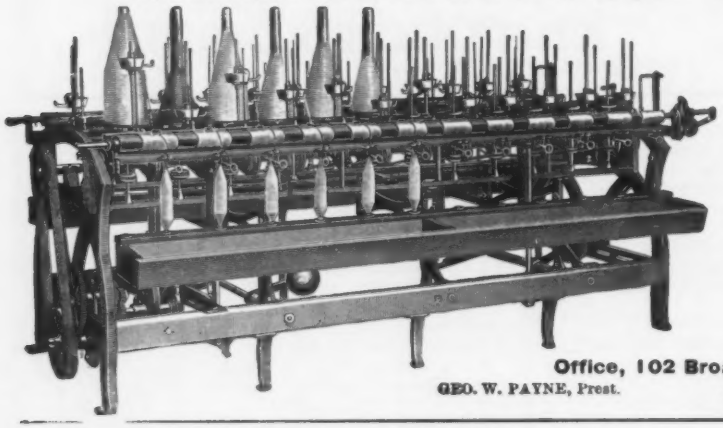
By Hosiery Manufacturers, Wind for Cop, Skein or Bobbin,



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Upright Spoolers

To Spool from Cop, Skein or Bobbin

Doubling Spoolers for doubling 2, 3, or more ends into one.

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

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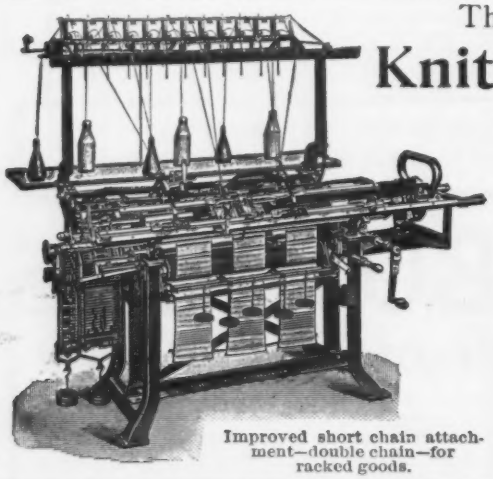

Improved short chain attachment—double chain—for racked goods.

That is the Brand of the

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worldwide known to be **The Best**

160,000 Knitting Machines in use all over the Universe

CLAES & FLENTJE

Muhlhausen Thr., Germany

(Largest Knitting Machine Factory in the World)

The cut represents one of our full automatic machines with double chain, short chain attachment, doing away with the long chain and lots of blocks.

Machines for all kinds of plain and fancy knit goods by hand and full automatic by power.

Our knitting machines are far superior to any other in simplicity and construction. They give a higher production than any other on the market.

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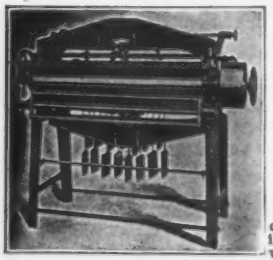

The "1912" Cloth Cutting Folding and Winding Machine.

This machine will cut down operating expenses. It does in one operation the work which is now being done in two. It cuts the cloth, folds the edges and rolls them up in one operation, and at all times gets one more strip out of a bolt of cloth than is possible with the old method of cutting. At the same time it measures the bolt of cloth to show the manufacturer whether or not he is getting the number of yards he is paying for. With the high price of cotton to-day every knit goods manufacturer ought to look into this to see if he is getting the maximum efficiency at the least expense. You will find when you come to figure it up in the course of a year that the labor it saves is a big item.

Also have other labor-saving devices, and upon application you can get prices and full information on same.

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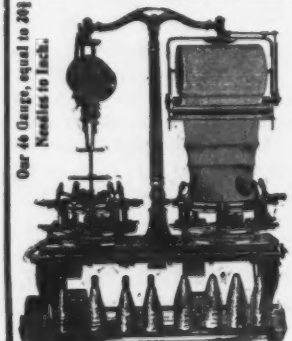

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A Simple, Inexpensive Machine, for **Attaching Tickets** on **Hosiery, Underwear,** etc.

It uses a pointed staple, **CANNOT INJURE THE FINEST SILK HOSE**; can be set aside when not in use.

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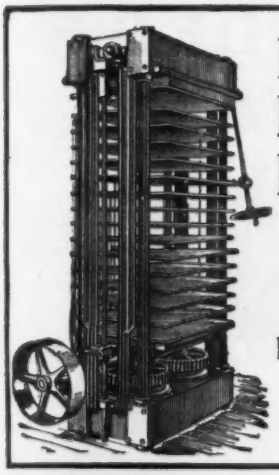

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For Hosiery and Underwear Trade

For price and particulars address

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Of Circular Spring Needle Loop-Wheel Knitting Machinery.

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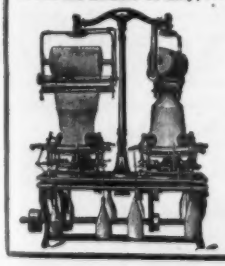
We submit the following extract from the sworn testimony of R. W. Gormly, in U. S. Circuit Court, Northern District of New York, in equity, No. 6764:

Cross Question 123. How long have you been a manufacturer of knitting machines? Answer I started in this business about the middle of May, 1900.



Tompkins Knitter

This design was adopted in 1875.

BUSINESS ESTABLISHED in 1846. before ROBERT W. GORMLEY Was born, according to his testimony in the case above cited.

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The STANDARD F, with attachments, can make any and all of these fabrics:

Plain Goods
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Three Color Stripes
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Garter Top
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Circular Rib Top and Seaming Machines.

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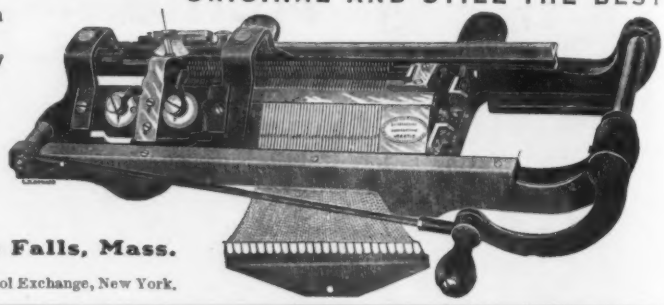

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with cylinder and dial in both single and two feed. Also

Single Feed Cylinder Necktie Machines

insuring a variety of stitches and patterns.

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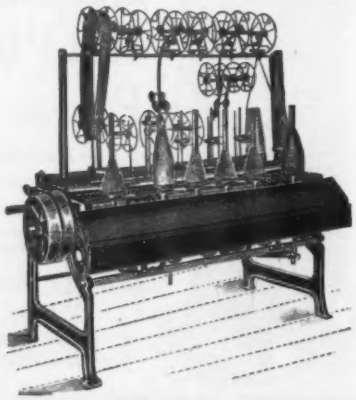

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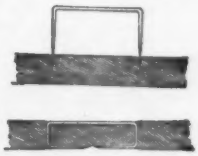
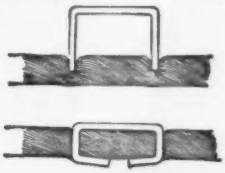
Look At The Difference!

THE BREHMER STAPLE OF FINELY POINTED WIRE



The fine points escape the threads and do not break them. The staple ends lie perfectly flat and smooth and do not stick up to catch on other goods. The stitch is readily picked out with the fingers.

THE STITCH OF OTHER MACHINES USING THE HEAVY WIRE



The coarse heavy wire and the blunt staples break the threads and leave unsightly holes after they are removed and require a knife to extract the stitch.

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New Jersey Wire Stitcher

Highest Grade

Machine for Rapid and Economical Method of Attaching Labels to Hosiery or other Garments.
Uses pointed staples, cannot tear the finest fabric.

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For Knit or Woolen Goods

The most reliable machine of the kind on the market.

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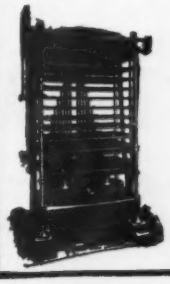

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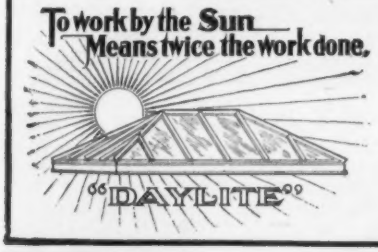

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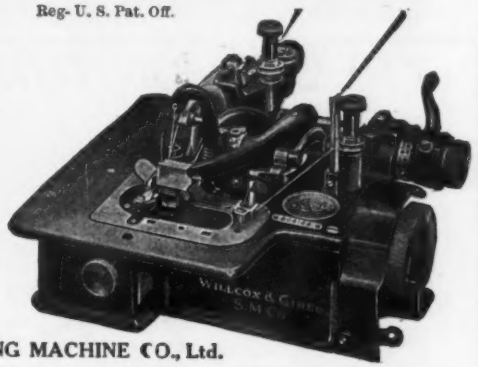
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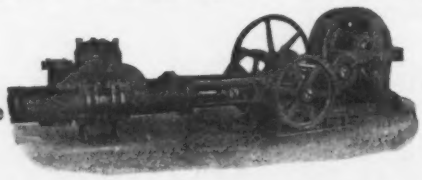

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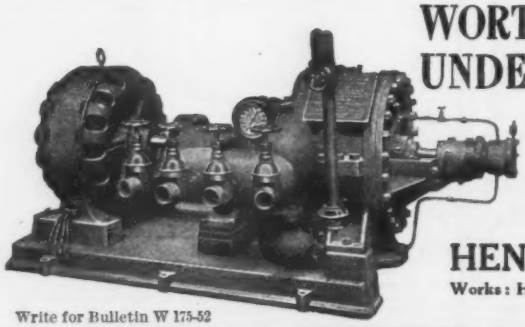

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AND WHY IT IS BEST IN

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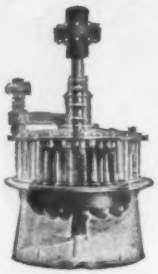

The Leffel Wheel, now developed into the Improved Samson Turbine, will continue to maintain, as it has for the past 49 years, its superiority because of features that give it wonderful power and high velocity, economy in the use of water, and an unusual steadiness of motion under variable gateage.

These are points of merit established by scientific and experimental tests.

Send for catalog illustrating and describing the different types and proving their merit

The James Leffel & Co.

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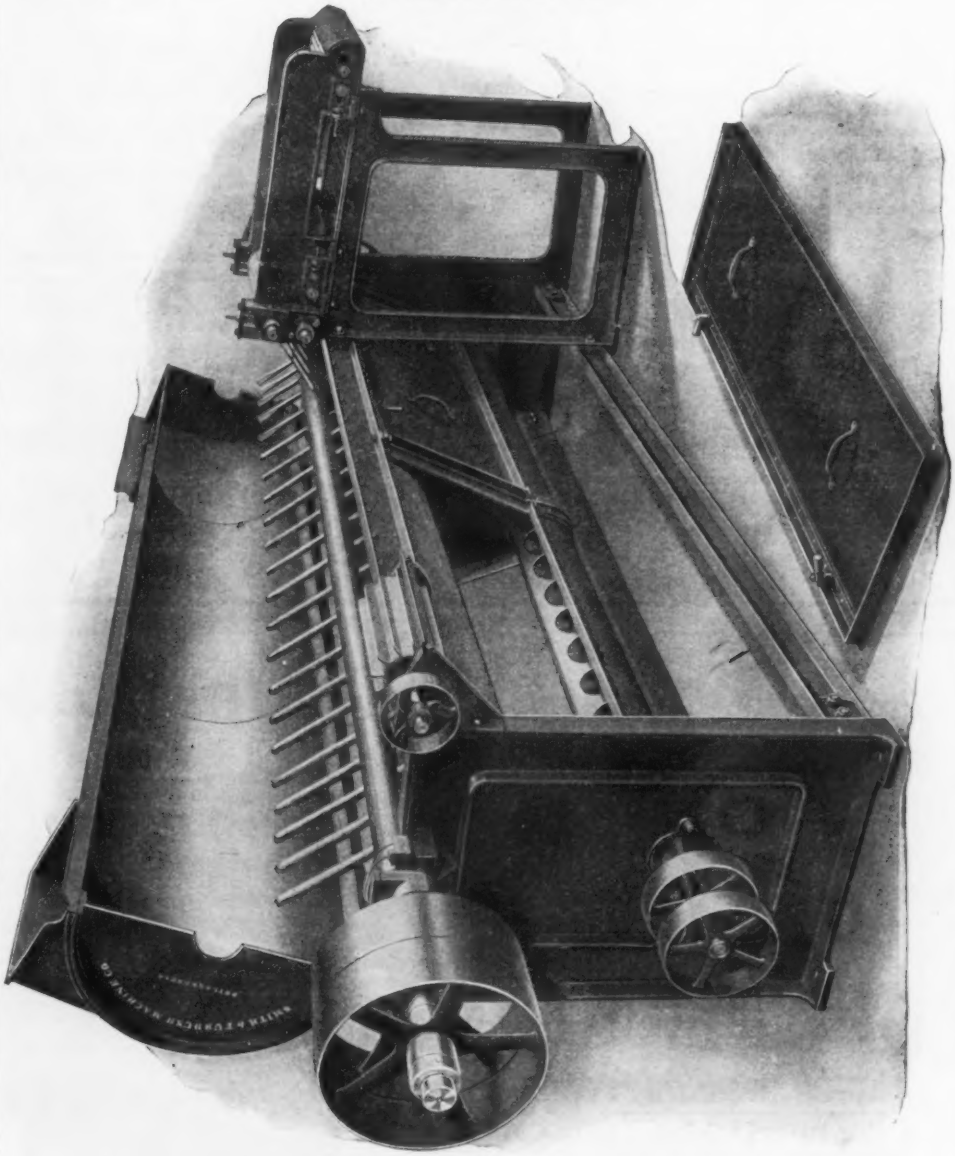
Smith & Furbush Machine Company

PHILADELPHIA



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With Spiral Dirt Conveyor

For opening and cleaning cotton stock, such as picker droppings, mill sweeps, card fly, linters, or other stock of a similar nature, without curling, rolling, pilling or injuring the fibres of the stock.

This cut shows feed apron and outlet on same side, whereas the standard machine has feed apron attachment on opposite side.

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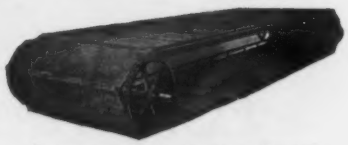

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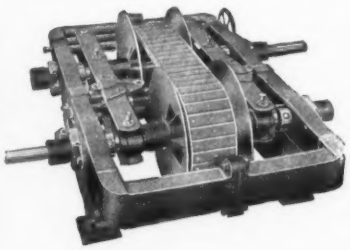

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